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COMBINED BACTERIOLOGICAL AND CLINICAL EVIDENCE.

BY F. FOORD CAIGER, M.D., F.R.C.P. LOND.,
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THE investigation described in this paper was made in order to see if laboratory methods, applied as thoroughly as possible to every case admitted with a diagnosis of diphtheria into an infectious fever hospital, would be helpful. In other words, would the extra time and trouble involved in such work give any real help (*a*) in the interests of the patient, (*b*) in the interests of hospital administration?

Procedure.

The patients were admitted to the South-Western Hospital of the Metropolitan Asylums Board. From every patient admitted with a diagnosis of diphtheria a swab was taken in the receiving-room by the medical officer on duty, and a clinical diagnosis made by her and entered in the record as "diphtheria," "probably diphtheria," "not diphtheria," or "probably not diphtheria." The first two groups are considered as a positive admission-room diagnosis of diphtheria, and appear in Table I. as *b*+; the two latter are recorded as a negative admission-room diagnosis, and appear as *b*−. The swab was sent to the Wellcome Physiological Research Laboratories some six miles away, where it was usually received the same day, and sown on Löffler's medium. From the swab a "direct smear" was made, and stained by Gram's method, in order to detect Vincent's organisms or streptococci, if present. After incubation for 18 to 24 hours a smear was made from the culture, and if organisms morphologically indistinguishable from K.L.B. were found, the laboratory diagnosis was entered as "M.D.B." Throughout this paper "M.D.B." is used to indicate bacilli morphologically indistinguishable from the *Bacillus diphtheriæ*; this is essentially a microscopic diagnosis. "K.L.B." is used to indicate a bacillus which microscopically appears to be *B. diphtheriæ*, isolated in pure culture, which ferments glucose but not saccharose, and may be virulent or avirulent to guinea-pigs.

The culture made from the swab on Löffler's medium and allowed to grow overnight was in most cases injected intradermically into guinea-pigs. From the swab or the culture on Löffler's medium plates were always sown, and one or more colonies picked off, grown for 24 hours, and injected intradermically into guinea-pigs.[1] In special cases the subcutaneous method was also used. If the provisional diagnosis made did not agree with the clinical diagnosis, a second swab was asked for. Thus the clinical and laboratory workers each had, while the patient was available, the opportunity of reviewing the diagnosis in view of the other's evidence.

The clinical work fell mainly on Dr. Amy Thoms and Dr. Ruby Inkster; the laboratory work was carried out by Dr. A. J. Eagleton (in the earlier part of the series), and Dr. C. C. Okell, Dr. H. J. Parish, and Miss M. Baxter throughout. From time to time the results were reviewed in conference by the above workers together with ourselves. Since the whole problem was approached from the clinical standpoint, the final decision in all cases rested with the clinician.

Results.

The investigation was carried on until 700 swabs had been examined. They are divided into two series, G, 1 to 600, and A, 1 to 100; 520 patients in all were examined. In Table I. are given the general results. If we consider for the moment series G, 1 to 600, it will be noted that in the case of 58·3 per cent.—i.e., cols. B, F, G, and D—of all patients certified before admission as "bacteriological" or "clinical" diphtheria, the diagnosis was confirmed,

TABLE I.—*Showing the General Results of the Examination.*

—	A	B	C	D	E	F	G	H
	Cases	Agreements—		*a*+ *b*− *c*−	*a*− *b*+ *c*−	*a*+ *b*− *c*+	*a*− *b*+ *c*+	*a*− *b*+ *c*?
		+	−					
G. 1–100	70	45	12	—	12	—	1	—
101–236	106	41	32	5	22	2	4	—
237–456	162	78	34	3	32	11	4	—
457–600	98	47	28	1	10	10	2	—
Total.	436	211 (48·4)	106 (24·3)	9 (2·1)	76 (17·4)	23 (5·3)	11 (2·5)	—
A. 1–100	93	57 (61)	15 (16)	1 (1)	2 (2)	—	10 (11)	8 (9)

a, Laboratory diagnosis. *b*, Admission-room diagnosis. *c*, Final clinical diagnosis.

while in 41·7 per cent.—i.e., cols. C and E—the original diagnosis could not be confirmed either clinically or bacteriologically. It is not suggested that this whole group represents definite errors in clinical diagnosis made by outside practitioners. Some of these "negative" patients had probably had clinical diphtheria a few days previously, and were "clearing up" when admitted. We must also remember that the general practitioner or the medical officer in a general hospital is often faced with a situation in which he considers it justifiable to send the patient to a fever hospital as a precautionary measure or on grounds of expediency.

Col. D: From nine cases virulent bacilli were isolated when the "admission diagnosis" and the final clinical diagnosis were negative. These would seem to be patients who had yielded a "positive" result during the swabbing of contacts or routine swabbing of schools or families. All nine carriers within a few weeks gave a succession of negative swabs. It is worthy of remark that col. D—i.e., the "carriers"—represents only 2 per cent. of the total admissions. We anticipated that most of the cases considered clinically negative by the hospital staff would have fallen into this group, whereas they fall into the group in which both the bacteriological and clinical evidence failed to confirm the diagnosis made before admission.

Col. E: Here the laboratory worker failed to find bacilli in one or more swabs and the clinician made the final diagnosis negative, though on admission the condition of the patient had justified a provisional clinical diagnosis of "probably diphtheria."

Col. G: These 11 cases are of considerable interest; in Table II. are given details.

TABLE II.—*Clinical Diagnosis Positive, but Laboratory Diagnosis Negative in all 11 Cases.*

	No. of cases.
Two negative swabs	1
Three " "	4
Four or more negative swabs..	2
Very few M.D.B.; not isolated	2
Avirulent (several colonies examined) ..	2

The notes from these cases have subsequently been carefully considered in conference; the laboratory workers' evidence in all these instances—i.e., the examination by cultural and inoculation tests—have failed to yield the results which are regularly obtained in frank clinical diphtheria. The clinicians, on the other hand, on reviewing the clinical records, felt that the course of the illness so closely resembled frank clinical diphtheria that a diagnosis of diphtheria was the only one open to them.

[1] Eagleton and Baxter: Brit. Med. Jour., 1921, i., 775.

The only point of outstanding interest is that in several of these instances the patient was admitted late in the course of a severe attack and received serum at a late stage of the disease; one would have expected some paralytic or myocardial symptoms to appear during convalescence, but this expectation was not realised and in none did these symptoms appear. More than one of these patients was shown to a class of students and a prognosis of paralysis during convalescence made, but no paralysis developed. Clinically, these cases certainly did not resemble syphilitic pharyngitis. It may be that the illness in these patients was caused by Vincent's organisms or streptococci. We are of the opinion that few, if any, of these cases can be thus explained, for we were naturally alive to these possibilities and had examined direct smears in every case.

From two patients avirulent organisms only were isolated. When the result of the virulence test was known some days had elapsed, and the opportunity of getting a second swab at an early stage of the disease had disappeared. The facts relating to these two patients are recorded above; virulent organisms may have also been present in the throat, but the swab either failed to collect any virulent organisms or collected extremely few, which could not be isolated. The few investigations that have been made indicate that probably more than 1 per cent. of the general population in London carry avirulent K.L.B. in their throats. Among 554 patients sent into a hospital one would expect to find a small number carrying avirulent K.L.B., in addition to the causal virulent organisms. The laboratory workers have found, in a total of approximately 2000 examinations in the past few years, three instances of the association of virulent and avirulent K.L.B. in the same culture, one from a healthy carrier, one from a convalescent patient, and one from a case of diphtheria.

The examinations in series A, 1 to 100, were carried out before those in series G, and before the arrangements for rapid interchange of results were working as smoothly as during the later G series. The general results resemble those of series G, except that under cols. G and H 20 per cent. of the patients appear, wh reas in series G col. H is unnecessary, and col. G contains only 2·5 per cent. Without emphasising the point too far, we are inclined to believe that, as the general result of this earlier work, the clinician came to feel that the laboratory evidence gave definite aid, and that where the "admission diagnosis" and the laboratory diagnosis did not agree there was a gradually increasing tendency to revise the "admission diagnosis." The results obtained from series A are not represented in the percentages quoted throughout the paper and in the general discussion.

The following points of interest emerged during the inquiry:—

1. In 95·5 per cent. of cases in which the diagnosis of diphtheria was confirmed, the first swab sent to the laboratory was found to be positive, and it is worthy of note that by the technique adopted virulent *B. diphtheriæ* were isolated from 93·5 per cent. (Table III.).

TABLE III.—*Clinical Diagnosis Positive in 245 Cases.*

	Cases.		Percentage.	
First swab positive—				
K.L.B. isolated—Virulent ..	229	234	93·5	95·5
,, ,, —Avirulent ..	2		0·8	
Very few M.D.B. present, not isolated	3		1·2	
Swab negative	11		4·5	

2. In five cases in a total of 436—i.e., 1·15 per cent.—later examination changed a negative laboratory diagnosis, which had been based on the examination of the first swab, into a positive diagnosis.

3. Amongst 234 patients where the clinical diagnosis was positive and M.D.B. were seen in the smear, isolation of virulent organisms was successful from the first swab in 231 instances, while in three instances—i.e., 1·2 per cent.—M.D.B. were seen in the first swab but could not be isolated, whereas from a second swab virulent K.L.B. were obtained.

4. Three laryngeal cases occurred in the series; from one virulent K.L.B. were obtained; from two, with a clinical diagnosis "uncertain, ? laryngeal diphtheria," no M.D.B. were obtained in culture.

5. In only two instances the clinical diagnosis was "nasal diphtheria," but from neither were K.L.B. obtained.

6. Amongst 182 cases clinically negative, no M.D.B. were obtained from cultures in 167 instances—i.e., 91·7 per cent.; in 11 instances—i.e., 6 per cent.—very few M.D.B. were seen in the smear made from an overnight culture, but could not be isolated. It is probable that none of these were true K.L.B.

From four only avirulent K.L.B. were isolated. From the cultures obtained from each of these four patients a number of colonies were examined for virulence.

Summary of Results.

1. Approximately 529 patients certified as suffering from diphtheria and admitted to the South-Western Hospital were included in the examination; 436 of them were closely studied. In 59 per cent. the diagnosis of diphtheria was confirmed. In 41 per cent. the diagnosis could not be confirmed.

2. Only nine cases, or approximately 2 per cent. of the whole, were healthy "carriers" of virulent *B. diphtheriæ*.

3. The laboratory workers' diagnosis agreed with the clinical diagnosis in 97·5 per cent. of instances; in 11 cases (2·5 per cent.) the laboratory evidence was directly against a diagnosis of diphtheria, while the clinical evidence was quite definitely in favour. No completely satisfactory explanation of these discrepancies suggests itself.

4. The first swab examination at the laboratory was found to be positive in 95·5 per cent. of instances in which the diagnosis of diphtheria was confirmed. From 93·5 per cent. virulent diphtheria organisms were isolated. In only 1·15 per cent. was a negative diagnosis which had been made from the first swab changed into a positive diagnosis by the examination of later swabs.

5. Two cases only were diagnosed as "nasal diphtheria," but from neither were *B. diphtheriæ* isolated.

Conclusions.

With regard to the questions set forth at the beginning of the inquiry we can answer:—

1. There is no evidence that the information obtained by the inquiry has altered or improved the prognosis or treatment of the patients suffering from diphtheria.

2. From the administrative point of view the inquiry has been justified; we feel that the investigation has resulted in an increased confidence and accuracy of diagnosis amongst the clinicians taking part. It should therefore facilitate the allocation of patients to the different wards in the hospital and ensure their release in "negative" cases at an earlier date than would be justifiable without full coöperation with the laboratory worker.

3. The accuracy of hospital statistics is much improved by the coöperation of the laboratory worker.

4. From the point of view of accuracy of diagnosis, we are definitely of opinion that laboratory facilit es similar to those described should be available in all large hospitals for infectious fevers.

The amount of laboratory work was very large, and it is probable that after this preliminary careful exploration of the field information of similar value can continuously be supplied by the labora ory worker, even if he dispenses with the routine animal tests and trusts to isolation and fermentation tests of pure colonies. The true *B. diphtheriæ* invariably and rapidly ferments glucose, but never saccharose. The animal test should be available in doubtful or difficult cases.

CLINICAL OBSERVATIONS UPON THE VALUE OF OXIDISED COD-LIVER OIL IN THE THERAPY OF RICKETS.

BY RICHARD WAGNER AND HANS WIMBERGER.

(With the Coöperation of OLGA PISCHINGER.)

(*From the University Kinderklinik, Vienna.*)

THE results obtained by Mellanby (1919 and 1921) in his experimental work with puppies, showing the distribution of anti-rachitic properties in animal fats, and especially the value of cod-liver oil, together with the observations of McCollum and his co-workers (1913, 1916) upon the distribution of the vitamin "fat-soluble A," necessary for growth and for prevention of eye disease in the young rat, have led many to the conclusion that the rickets-preventing property of these fats was due to, and in proportion to, their content of fat-soluble A.

In support of the view that the anti-rachitic organic factor is identical, or closely connected, with vitamin A are the following facts: The distribution of the two principles in nature is, on the whole, similar; both are resistant to the action of heat in absence of oxygen and both sensitive to temperatures of 100° C. and over, in presence of oxygen. In both cases the active principle is found in the unsaponifiable fraction of the fat in which it occurs naturally and in both cases light radiation is able to enhance, and under certain circumstances to substitute, the effect of the vitamin.

No clinician or experimental worker has to-day any doubts concerning the therapeutic value of cod-liver oil in rickets. But the question whether this therapeutic effect depends in fact upon its content of vitamin A, and can be replaced by fat-soluble vitamins from other sources, is much debated at present, and could only be answered after many detailed and laborious animal experiments.

The Two Fat-soluble Vitamins in Cod-liver Oil.

The recent researches of McCollum and his school (1921, 1922), however, point definitely to the conclusion that two separate fat-soluble vitamins are present in cod-liver oil: a growth-promoting and xerophthalmia-preventing principle (vitamin A) on the one hand, and a calcium-depositing or anti-rachitic principle on the other. The evidence in support of this view is briefly as follows. Butter, while possessing a value for cure of xerophthalmia comparable with that of cod-liver oil, was greatly inferior in its capacity to maintain growth on diets deficient in calcium or to cure rickets developed on diets deficient in calcium or in phosphorus. After subjection to prolonged heating in presence of oxygen (12 to 20 hours at 100° C.) cod-liver oil retained its property of curing rickets in rats, but had lost all anti-xerophthalmic power. McCollum and his co-workers also showed differences to exist in the distribution of these two principles among certain vegetable oils, coconut oil, for example, displaying anti-rachitic properties, while possessing no power to cure xerophthalmia. Comparable results were obtained by McClendon and Baughess (1921) and by Goldblatt and Zilva (1923) who showed that spinach, while able to promote growth and cure xerophthalmia in rats with daily doses of 0·1 to 0·25 g., had no effect in promoting deposition of calcium even when 3 g. was administered. Goldblatt and Zilva also measured the rate of destruction by heat oxidation respectively of the growth-promoting and the rickets-healing properties of cod-liver oil. Before treatment, the minimal doses required to demonstrate these two properties were found to be approximately equal in the sample of oil employed, but the anti-rachitic function was proved to be distinctly the more resistant to oxidation at 120° C., thereby confirming the result obtained by McCollum and his co-workers.

Further evidence upon this point is given by the researches of Zucker, Pappenheimer, and Barnett (1922), who, by boiling cod-liver oil with alkali without precautions to prevent oxidation, were able to prepare an extract with anti-rachitic value 100 times as potent as the original oil. Using the same method of concentration with other sources of fat-soluble vitamins (vitamin A), such as butter, coconut oil, spinach, sheep's liver, Zucker and Barnett (1923) were unable to prepare substances which approached the potency of that obtained from cod-liver oil. Stölzner (1921), working on different lines, has recently prepared an "oxy-cod-liver oil," of which the calcium salts of the oxidised fatty acids were found to possess high anti-rachitic potency. This result recalls the hypothesis of Freudenberg and Klocmann (1913 and 1914) that the action of cod-liver oil in rickets is bound up with its high content of unsaturated fatty acids.

Different Ætiology of Rickets and Xerophthalmia.

The above results point to the conclusion that two vitamins exist, a calcium-depositing or anti-rachitic on the one hand and a growth-promoting and xerophthalmia-preventing on the other, that the distribution of these two vitamins, though similar, is not identical, and that they exhibit a different resistance to heat and oxidation.

There are also clinical observations in support of the thesis that rickets and xerophthalmia have a different ætiology. One of the authors (R. W.), in conjunction with Schick (1923), has described a case of a child who died in hospital with severe xerophthalmia, whose skeleton both by X ray examination and at autopsy was found to be completely free from rickets. 40 out of the 77 cases of xerophthalmia in Bloch's (1918) well-known series, were free from rickets; in the case of four children who died this was confirmed at autopsy. On the experimental side, the observation of Sheets and Funk (1922) as well as those of Powers, Park, and Simmonds (1923) have shown that ultra-violet rays are unable to prevent or cure xerophthalmia on diets free from vitamin A, whereas, in rats upon rickets-producing diets, rickets can be prevented as well as cured by these rays.

The Anti-rachitic Principle in Cod-liver Oil.

As to the constitution of the anti-rachitic principle in cod-liver oil it is only possible to put forward certain suggestions. There has been an inclination to explain the therapeutic properties of cod-liver oil for rickets in terms of its high content of cholesterin (Wacker and Hueck, 1913). Zucker, Pappenheimer, and Barnett (1922) have lately turned their attentions to the unsaponifiable fraction of cod-liver oil. They extracted the calcium soaps with acetone and found the cholesterin-free residue of the unsaponifiable fraction to be active in very small amounts in the cure of rickets, but to have no anti-xerophthalmic properties. Quite recently Beumer (1924) has shown that unsaponifiable ether-soluble substances can be synthesised in young dogs when they are not present in the food. Beumer concludes from this fact that the synthesis of these unsaponifiable substances is disturbed in rickets but can be restored under the action of light. Beumer considers treatment with cod-liver oil to be a "substitution" therapy and light treatment to be "causal" therapy.

Clinical Observations on the Value of Oxidised Cod-liver Oil in Rickets.

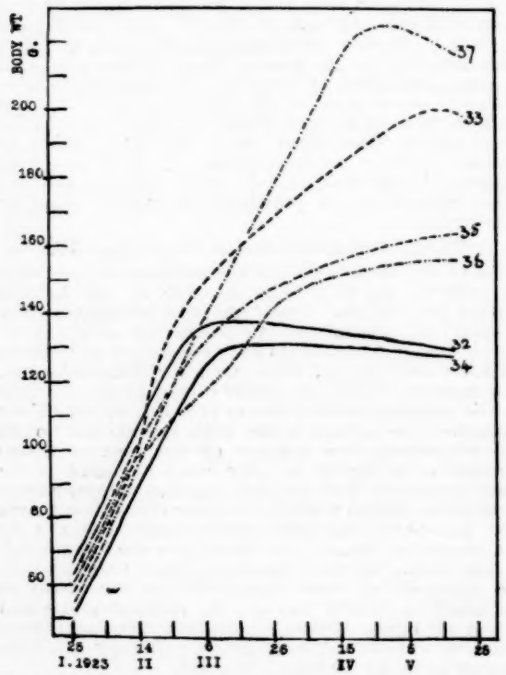
The following observations on the treatment with oxidised cod-liver oil of four infants suffering from rickets is a modest contribution to the solution of the problem of the presence of the two different therapeutic principles in cod-liver oil. The children were admitted into the clinic in a condition of active rickets, as shown by X ray examination of one extremity. Only those cases which showed characteristic signs of rickets in the X ray photograph were included in the observation. It was especially important to exclude cases, however severe the lesions, with signs of commencing

cure, a fact which usually can only be determined after two or three consecutive weekly X ray examinations. The children's diet was for the most part that usual for infants in the clinic; full cows' milk with sugar, and cereal foods prepared with sugar and full milk, lemon-juice or orange-juice being added as anti-scorbutic.

The oxidised cod-liver oil "V.1." was kindly provided for us by Dr. Zilva, of the Lister Institute, London. The oxidation had been carried out at a temperature of 120° C. for 24 hours in a current of oxygen. The oil was tested by means of growth experiments with rats for its content of vitamin A and compared with a potent sample of untreated cod-liver oil. The basal diet employed and the general methods used for these experiments were the same as those used by Hume (1923) in this clinic. Young rats of about 50 g. body-weight were placed upon a diet complete in every respect but deficient in vitamin A. After weight had become stationary, the oil to be tested was added, the daily dose being fed to each rat with a pipette. The weight curves of these animals are given in the accompanying Figs. 1 and 2.

Fig. 1 shows the effect of untreated ("P.C.") and oxidised oil ("V.1."). The three animals receiving the oxidised oil "V.1." had 10 drops daily. At the end of the four months' observation the three animals receiving this oil showed the general symptoms of vitamin-A deficiency: retarded growth, enophthalmus, conjunctivitis, numerous small hæmorrhages

FIG. 1.

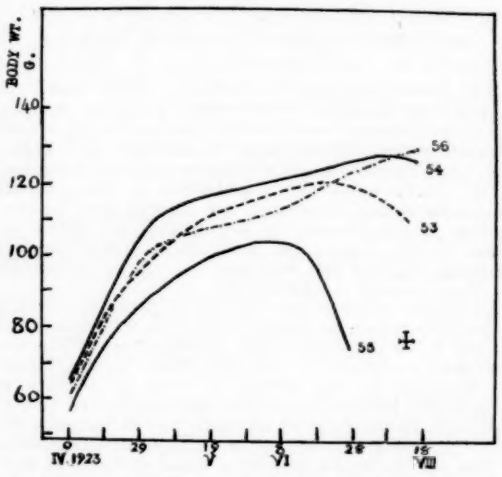


Weight curves of rats on "−A" diet. Nos. 32, 34, and 36 received in addition 10 drops daily oxidised cod-liver oil "V.1." Nos. 33, 35, and 37 received 1 drop untreated cod-liver oil "P.C." every second day until March 8th–12th, afterwards 1 drop every day.

on the eyelids, staring coat, discoloured teeth, lethargy, and loss of appetite. In no cases was there actually keratomalacia. A daily ration of 10 drops of the oxidised cod-liver oil was, therefore, not adequate to maintain normal growth and to prevent the effects of vitamin-A deficiency.

The three animals receiving the untreated oil "P.C." had a comparatively small dose: 1 drop every other day for the first six to seven weeks and afterwards 1 drop daily. Nevertheless, their final body-weights were greater than those of the "V.1." animals, and two of the three (Nos. 33 and 37) approached the maximum weight of normal rats at their period of growth. There was no symptom of

FIG. 2.



Weight curves of rats on "−A" diet. Nos. 53 and 54 received in addition daily 10 drops oxidised cod-liver oil "V.1."

vitamin deficiency nor any trace of conjunctivitis; and there was a definite accession of growth when the daily dose was increased to a whole drop daily. We calculate, therefore, that the limiting values of the two samples of oil with regard to growth-promotion and prevention of xerophthalmia were, oxidised to untreated, as 1 to 20.

Fig. 2 shows growth curves of two animals, 53 and 54, who received 10 drops oxidised cod-liver oil, "V.1.," daily, in comparison with two other animals, 55 and 56, who received the basal "−A" diet without any addition. The curves show that the oxidised cod-liver oil in the doses used by us may be regarded as free from vitamin A.

The clinical observations were made upon four cases, three moderately severe and one severe, all in the active stage. The X ray signs were unmistakable: very coarse structure of the spongy bone in the shafts, a more or less irregular frayed contour at the ends of the shafts, especially at the more quickly-growing metaphyses, at the distal ends of femur, radius, and ulna; in addition, a general diminution of calcium content markedly demonstrated in the faint shadows given by the centres of ossification.

The *effect of the therapy* was determined by means of X ray photographs which, as was shown by the researches of Chick and co-workers in this clinic (1922, 1923) and by many American observers, not only enables a trustworthy judgment to be made as to the stage of the bone lesions, but also clearly demonstrates all the fine details of the healing process.

The picture of active rickets given above showed no alteration in a preliminary period of about eight weeks' observation without special therapy, in Cases 2 and 4. Only when healing began, after treatment, was a fine cross-way band of shadow visible, several millimetres removed from the frayed end of the shaft, corresponding to the formation of a new preparatory zone of calcification at the end of the uncalcified rachitic tissue which had developed during the period of the active rickets. This new deposition of calcium marks the beginning of normal endochondral ossification and of normal growth in length in the cartilaginous zone. Deposition of calcium then takes place in the area between the new zone of provisional calcification and the end of the shaft, at

a rate depending on the rapidity of the healing process. At length, after several weeks, the end of the diaphysis shows a normal structure and the previous rickets is only to be detected by the contrast shown between its fine close structure and the coarse-grained appearance of the structure of the bone-shaft.

The *calcium content of the bone* also increases with the beginning of the healing process. This is best shown in the development of the so-called "osteophyte layer" of periosteal fibrous tissue which forms a more or less close sheath around the shaft of the bone. The rate of healing was compared with that of similar cases receiving untreated cod-liver oil (see Wimberger, 1923). In cases of therapy with untreated crude cod-liver oil, the first signs of healing were apparent after about 2–3 weeks (14–24 days); in the present case the period varied from two to five weeks, and especially in regard to the later course of the recovery, the rate of healing in these observations was definitely slower than with untreated cod-liver oil. The course of healing was not observed to differ in any way from that observed in X ray with other therapeutic agents (sunlight or mercury-quartz lamp radiation).

Case Histories.

CASE 1.—F. G., male, aged 6 months. Admitted Feb. 7th, 1923. Child cannot sit alone, skeleton shows swellings at the epiphyses, well-marked rosary, no craniotabes, dimensions of fontanelle 4 by 4·5 cm. Clinical examination otherwise negative, with the exception of rhinitis with a slight pharyngeal murmur. Tuberculin reaction negative. X ray examination showed active rickets in moderate degree. Feb. 8th: Therapy begun with oxidised cod-liver oil, gradually increasing dose from 4 to 20 g. daily of a 50 per cent. emulsion. 12th to 28th: Respiratory infection with middle-ear inflammation and pneumonia. March 1st: Unchanged in X ray. 8th: Normal temperature, increasing in weight, obstinate rhinitis and bronchitis. X ray shows suggestion of healing at the proximal end of the fibula. 15th: X ray picture shows distinct signs of healing in tibia and fibula. 22nd: Marked improvement in general condition. X ray photograph shows healing of the skeleton to be progressing. 29th to May 10th: X ray shows progressive healing of bone lesions at a slow rate. May 12th: Lungs free, chronic rhinitis. Can sit with support. June 7th: Skeleton shows well-calcified regular ends to the bone-shafts, with wide, thick osteophyte layer; healing almost complete.

CASE 2.—H. M., male, aged 9 months. Admitted Feb. 13th, 1923. Moderately well nourished. Skeleton shows strongly-marked rosary, slight craniotabes with some hydrocephalus, dimensions of the great fontanelle 3 by 3 cm., no teeth, moderate swellings at the joints. X ray shows active rickets of moderate grade, slender bones with well-marked calcium deficiency; the ends of the metaphyses with finely fringed outlines; suggestion of osteophyte layer at radius and ulna. Feb. 14th to April 15th: Preliminary period of observation without special therapy. Child had chicken-pox, but made good recovery and gain in weight. X ray examinations during this period showed bone lesions to have remained unchanged. April 15th: Therapy begun with oxidised cod-liver oil; dose gradually raised to 20 g. daily 50 per cent. emulsion. First attempts to crawl. 24th: X ray picture unchanged. May 1st: First definite signs of healing shown in X ray by deposition of calcium in the distal metaphysis of the ulna. 15th: Good progress in healing of the bone lesions shown in X ray. Acute attack of bronchitis with fever and loss of weight. 24th: Extraordinarily quick progress in the repair of bone lesions. Recovering from bronchitis; gaining in weight. June 19th: Healing of rickets far advanced. 23rd: Discharged.

CASE 3.—E. B., male, aged 5 months. Admitted March 23rd, 1923. Nutrition good, skin clear, œdema present in both feet. Skeleton shows well-marked rosary and severe craniotabes; dimensions of fontanelle 3 by 3·5 cm., no teeth. Chvostek test definite, tendon reflexes increased. Spleen not palpable. Tuberculin test negative. Slight bronchitis. X ray shows active rickets with moderate degree of calcium deficiency; the ends of the shafts are slightly cupped and markedly fringed in outline. March 24th: Frequent attacks of laryngospasmus. April 1st: Therapy began with oxidised cod-liver oil, gradually increasing from 2 to 20 g. daily of a 50 per cent. emulsion. 7th: X ray examination shows no change. The Chvostek sign disappears promptly after doses of 10 per cent. ammonium chloride. Slight increase in body-weight. 14th: Doubtful signs of healing in X ray at proximal ends of tibia and fibula. 21st: Definite healing visible in X ray in femur, tibia, and fibula. 25th: Middle-ear inflammation following a cold infection. 28th: General condition good, putting on weight, can sit with support. X ray shows deposition of calcium to be far advanced in the healing metaphyses at the proximal ends of the tibia and fibula, and to a less degree at the distal ends of the ulna, radius, and femur. May 26th: X ray shows healing process to be almost complete. 29th: Discharged.

CASE 4.—A. F., male, aged 12 months. Admitted April 27th, 1923. Child in poor general condition, had recovered from measles one week before admission; very pale and thin. Skeleton shows marked rosary and swollen joints, soft skull with hydrocephalus; dimensions of the fontanelle 3 by 3·25 cm.; two teeth. Child has a pot-belly, spleen hard and palpable two fingers' breadth below the rib margin; enlarged liver. Bad croupy cough with dyspnœa, action of alæ nasi obvious in breathing, fine râles over the apex of the right lung. Tuberculin test negative. X ray examination shows severe active rickets, with marked calcium deficiency, very coarse structure of spongy bone, the ends of the metaphyses frayed, green-stick fracture of the right fibula. April 27th to June 27th: X ray shows condition of the skeleton to remain unchanged. During this period the child suffered from a severe attack of bronchial pneumonia, making a fair recovery. Severe anæmia with marked splenic enlargement. June 28th: Administration of oxidised cod-liver oil begun. July 4th: Cough and cold infection, fever, severe anæmia (Hb=35, Sahli). 25th: Recovered. X ray photograph shows suggestions of healing at the ends of all metaphyses. August 2nd: Healing definitely apparent in X ray at the distal end of ulna and radius, and at the proximal end of tibia and fibula. The anæmia and general condition better. 15th: Healing shows slow progress. Anæmia slowly improving, spleen unchanged; 1 per cent. solution of tartar emetic given intravenously. Sept. 5th: X ray shows a fresh distinct line of calcification at the epiphyseal end of the wide rachitic zone. Oct. 10th: The ends of the bone-shafts regular in contour. Good general condition, can stand with support. Therapy with *untreated* cod-liver oil begun. Oct. 27th: Discharged. General condition good, rachitic bone lesions almost healed.

Conclusions and Summary.

1. Four cases of active rickets in infants, aged from 5 to 12 months, were treated with oxidised cod-liver oil (heated for 24 hours at 120° C. with air bubbled through). The daily dose was 10 g. and the cases, carefully controlled with regular X ray examination, showed satisfactory healing of the bone lesions at a rate rather slower than with the same dose of a potent, crude, untreated cod-liver oil.

2. The growth-promoting potency of the two samples of oil, tested by growth experiments on rats, was found to be in the ratio of about 1 : 20.

3. Assuming that a daily dose of 10 g. untreated cod-liver oil, when used in therapy of rickets, does not provide any great excess of anti-rachitic principle, these observations lend support to the view that cod-liver oil contains two active organic factors: (1) anti-rachitic or calcium-depositing, and (2) growth-promoting (vitamin A), and that the latter is the more sensitive to oxidation at a high temperature.

Our thanks are due to Dr. Zilva for kindly supplying the sample of oxidised cod-liver oil, to the Lister Institute for a supply of the purified materials used in the basal diets for the animal experiments, and to the Medical Research Council for a grant in aid and for other help. We want to express special thanks to Miss Harriette Chick, who kindly helped us, not only in the translation, but also by her constant advice and interest in the matter.

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SOME FACTORS INFLUENCING THE FLOCCULATION METHODS OF DREYER-WARD AND SACHS-GEORGI.

BY I. R. MÖRCH.

(From the Slate Serum Institute, Denmark. Director: Dr. Th. Madsen.)

SINCE Dreyer and Ward in 1921 published their quantitative sero-reaction—Sigma reaction (S.R.)[1]—for the diagnosing of syphilis, this has, after a series of experiments made on the initiative of the Hygienic Committee of the League of Nations,[2 3] and the Medical Research Council,[4] been acknowledged in most quarters as an excellent diagnostic reaction, just as sensitive—and perhaps more so—than the various modifications of Wassermann's reaction (W.R.), and of high specificity. Some of the experimenters (Houston, Boyd Campbell, Smyth, Rankin and Hall, Stokes and Wigham,[4] Mörch and Thaysen,[5] Mörch, Boas, Pontoppidan[6]) devoted themselves also to the quantitative side of the reaction, and have accordingly found that the method is sufficiently exact* to enable one to follow the result of treatment. It therefore seemed possible that in the S.R. one might possess a standard reaction which, provided that the reaction was carried out exactly according to the directions, would give fully comparable results in any laboratory whatever; but, as the following shows, this involved greater difficulty than had been expected.

In connexion with the researches instituted by the Hygienic Committee of the League of Nations, a number of syphilitic sera were divided into small portions, placed, sterile, into ampoules and sent out to various laboratories (Drs. Harrison and Wyler, London; Prof. Hirszfeldt, Warsaw; Dr. Renaux, Brussels) where they were examined the same day. The results obtained proved to be far from comparable, as will be seen from the following examples taken from the report on the subject to the Hygienic Committee of the League of Nations[3]:—

No.	Σ Units per c.cm.			
	London.	Warsaw.	Copenhagen.	Brussels.
21	6·8	5·2	1·8	13·4
29	6·8	5·9	3·0	27
40	8·3	5·6	1·8	27
42	8·3	10·1	3·0	34
52	29·5	53	5·5	>54
58	27·0	237	50	>54

In November–December, 1923, an International Serological Conference was held in Copenhagen at the instance of the Committee of Hygiene of the League of Nations, for the purpose of making comparative examinations into the various methods in use for the sero-diagnosis of syphilis. A number of modifications of W.R. were tested, as well as Meinicke's reaction[3] (modification "D.M."), Sachs-Georgi's reaction (S.-G.R.), the S.R. and Meinicke's "trübungs" reaction. The principal results of the work of the conference were, that all the flocculation reactions were perceptibly inferior as regards sensitivity to several of the Wassermann methods used. As regards the S.R., this created considerable surprise, as most of the members of the conference had already had opportunity to determine the absolute superiority of the S.R. over the Wassermann method used by them.

Investigation into the Importance of Details.

The experiments first mentioned of sending samples of the same serum to various laboratories had shown that—contrary to expectation—quantitatively corresponding results with the † S.R. were not obtained, and later on the work of the international conference showed that this rather unaccountable lack of stability might have considerable influence upon the sensitivity of the reaction. It therefore occurred to me that it might be useful to examine to what degree the S.R. is dependent upon various small details which had hitherto not been closely examined, such as slight fluctuations in the temperature of the water baths used, the use of various kinds of cholesterin, the carrying out of the reaction in an open or a closed water bath, the factor so strongly emphasised by Dreyer and Ward that those parts of the Sigma tubes which contain the liquid must be one-half to two-thirds covered by the water in the water bath. As the weakness of flocculation reactions observed during the International Conference included all these contingencies, the relation of the S.-G.R. to these factors was also included in the examination.

This examination comprised the following points: (1) Use of various kinds of cholesterin; (2) the importance of inactivating serum in tubes closed by rubber corks instead of in tubes plugged with cotton-wool; (3) the importance of slight fluctuations in the temperature at which the serum is rendered inactive; (4) the placing of the tubes in an open or in a closed water bath; (5) the importance of fluctuations in the temperature at which the reaction is begun; (6) the importance of the Sigma tubes being immersed in the water in the manner directed.

In all the examinations the directions given by the respective writers were adhered to exactly in all details. The tests were made in especially carefully calibrated tubes. The calculations of the strength of the Sigma reactions were in all cases made on the average of two readings with flocculations from St+ to tr as a base. The S.-G.R. was also titrated quantitatively, as there is a 50 per cent. fall in the serum quantity in each successive tube, the strength of the reaction being expressed by the reciprocal value of the lowest serum dose, which gave a certain finely granulated precipitate. As the measured serum doses were pipetted decreasing with 50 per cent. for each tube (largest dose 0·2 c.cm. in total volume 0·75 c.cm.) the accuracy of this value is, however, only approximate.

1. *The Use of Various Kinds of Cholesterin (S.R.).*—Eight different samples were tested, one of my own making, five of Kahlbaum's, and two of Merck's. The tests were made so that to the same Sigma extract was added the prescribed quantity of cholesterin and a number of sera titrated quantitatively with the extract-cholesterin suspensions thereby produced as antigen. All the samples of cholesterin were tested at the same time. The results will be found summarised in Tables I. and II. Table I. shows that the cholesterins tested may, according to their action, be divided into three groups: Group I. comprises the four Kahlbaum cholesterins and that of my own making; Group II., which had a rather

* A number of sera, kept in a frozen state and examined on various days (up to 30–40 times), gave practically identical values on each examination.

† The W.R. and S.-G.R. were examined and the results of these were still less comparable.

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weaker action, comprises the two Merck cholesterins; and Group III. only a Kahlbaum cholesterin (V.), which was of very low value. Since these investigations thus have shown that different samples of cholesterin

TABLE I.

Serum No.	Units per c.cm. with cholesterin.							
	Own making.	Kahlbaum.					Merck.	
		I.	II.	III.	IV.	V.	I.	II.
1	85	88	88	85	81	68	77	77
2	81	85	81	81	77	62	68	67
3	50	44	50	47	44	36	43	41
4	39	43	40	39	39	28	31	33
5	10	10	9·7	9·7	9·4	6·7	8·6	8·6
6	9	9·6	9·6	9·4	9·0	6·6	7·7	7·7
7	3·8	4·3	4·2	3·8	3·8	3·1	3·4	3·6
8	2·8	3·1	3·1	2·8	2·8	2·3	2·8	2·5

may vary considerably, it would perhaps be desirable that each consignment of extract should be accompanied by some of the identical cholesterin which has been used in the estimation of the suspension factor, making it also possible to test the value of the cholesterin to be used. It would, naturally, be best if, by an alteration of the composition of the extract, the reaction could be strengthened, so that the cholesterin could be dispensed with, as proposed by Renaux.[3] This would be of advantage in another way, for, as will be seen from Table II., the strengthening of the reaction which is obtained by the addition of cholesterin is very different for the various sera; if, for instance, Serum No. 2 is strengthened 98 per

TABLE II.

Serum No.	Σ Units without cholesterin.	Group I.		Group II.		Group III.	
		Units aver.	Increase.	Units aver.	Increase.	Units aver.	Increase.
			%		%		%
1	59	85	44	77	31	68	16
2	41	81	98	68	66	62	51
3	31	47	57	42	36	36	16
4	25	40	60	32	28	28	12
5	6·2	9·8	58	8·6	39	6·7	9
6	5·5	9·3	69	7·7	40	6·6	20
7	2·9	4·0	38	3·5	21	3·1	7
8	2·0	2·9	45	2·7	35	2·3	15

cent., Serum No. 7 only 38 per cent. of Group I.'s cholesterins, the same sera are strengthened 51 per cent. and 7 per cent. of Group III.'s cholesterins. The addition of cholesterin thus causes a change in the original relative strengths of the various sera.

2. *Closing of Tubes for Rendering Sera Inactive* (S. and S.-G.R.).—Dreyer and Ward direct that the inactivation of the sera should be carried out by isolation in tubes plugged with cotton-wool, since they find that a tightly closed tube (closed with cork or rubber or sealed in flame) often causes a weakening of the reaction, as the process of inactivation takes place under a certain pressure.

If Meinicke's "trübungs" reaction is carried out on the same sera, wadding plugs may often prove unsatisfactory as even small pieces of cotton flock in the serum may cause unspecific reactions. In our Institute we therefore used rubber corks until Prof. Dreyer recently drew attention to the fact that this involved the danger mentioned above. The investigation into the importance of this was made in the following way: each serum was divided into two tubes of the same diameter containing an equal quantity, after which one was closed with a plug of wadding and the other with a rubber cork. After inactivating in the usual manner the S. and S.-G.R. were carried out on the various serum samples. With the S.R., the result was that this was in some cases weakened by inactivating in tubes with tight rubber corks. As a sum total, 35 sera were examined, and of these the weakening was in: 13 cases 0; 10 cases, 0–10 per cent.; 8 cases, 10–25 per cent.; 4 cases, 25–50 per cent. Sera for the S.R. should therefore be inactivated in tubes closed with a loose plug of cotton-wool and not with cork or rubber.

With the S.-G.R., 20 sera were examined. These were titrated quantitatively (with falling doses of serum). In no case was it possible to determine any weakening of the reaction by inactivating in tubes closed with rubber corks in contrast to tubes closed with a cotton-wool cork. This is probably due to the shorter period of inactivation.

3. *Fluctuations in the Temperature of Inactivation* (S. and S.-G.R.).—In their first report Dreyer and Ward directed that inactivation should be continued for 90 minutes at 53°–54° C. The temperature was raised later[4] to 55°; S.-G.R. inactivates in 30 minutes at 55° C. Six sera were tested, of which a sample was inactivated 90 minutes at 53°, 54°, 55°, 56°, 57° C. respectively. The result of the test is summarised in Table III.

TABLE III.

Serum No.	1		2		3		4		5		6	
C.	Σ u.	S.-G.	Σ u.	S.-G.	Σ u.	S.-G.	Σ u.	S.-G.	Σ u.	S.-G.	Σ u.	S.-G.
53°	155	100	85	50	55	75	15·0	20	3·2	10	2·5	5
54°	155	100	85	50	55	75	15·0	20	3·1	10	2·3	—
55°	148	100	80	50	50	75	13·5	20	2·9	10	1·6	—
56°	128	100	75	50	42	75	10·0	20	2·5	10	0·9	—
57°	85	70	65	50	19	65	6·5	15	1·9	7	0·0	—

Σ u = Σ units.

The table shows that the strength of the S.R. declines with increasing the inactivating temperature, commencing at 54° C., and that the weakening is not proportionate to the temperature, the rate of weakening increasing considerably for every degree the temperature rises. As far as the S.-G.R. is concerned, no perceptible weakening of the reaction was determined until the temperature got beyond 56°; this is presumably due to the rather imperfect quantitative method, which does not permit of the determination of slighter weakening than 25–50 per cent., and also to the fact that the weakening is less with the shorter period of inactivating. It must therefore be strongly advised, especially as regards the S.R., that great care be taken that the temperature of the inactivating water bath is kept absolutely constant.

4. *Nature of the Water Bath* (*Sigma*).—In their work Dreyer and Ward emphasise the importance of carrying out the S.R. in a water bath and not in a dry air incubator, as the latter is said to give much weaker reactions. On the other hand, they do not indicate whether the water bath ought to be closed or open. As in our institute we generally use large, well-insulated water baths with fairly tight lids and containing 60 to 80 litres of water (the temperature thus being kept more constant and dust being kept out), used, for instance, for the W.R., these have until recently been also used for the S.R. During the International Serological Conference mentioned previously, we learned, however, that most investigators (Dreyer and Ward included) had used small open water baths. The experiments mentioned at the commencement of this work (the sending of the same serum samples to various laboratories) and later on the work of the Copenhagen Conference, showed that the values obtained for the S.R. compared with the W.R. were obviously weaker than those found elsewhere. It therefore appeared to me necessary to try whether this could possibly, to any degree, be due to the use of the covered water baths. A number of sera were pipetted in duplicate, one set being placed in a little open water bath, the other in the covered water bath generally used, both of them in such a way that half the liquid in the tubes

was submerged in the water. Altogether, 110 sera were tested in this manner. The result was that—

18	sera reacted	equally in both water baths.	
3	,, ,,	0–10 %	more strongly in the open than in the covered bath.
9	,, ,,	10–25 %	
11	,, ,,	25–50 %	
29	,, ,,	50–100 %	
19	,, ,,	100–200 %	
4	,, ,,	200–400 %	
2	,, ,,	500 %	
15	,, ,,	positively (1·6–2·8 units) in the open bath and negatively in the covered bath.	

Thus, about 84 per cent. of the sera tested reacted more strongly in the open than in the covered water bath. The difference was so great (in 36 per cent. of the cases more than 100 per cent.) that this alone can explain the rather poor result obtained with the S.R. during the conference in Copenhagen in 1923.

As to the cause of the phenomenon it is impossible to say anything definite, but the explanation is probably the increase in the degree of flocculation (from tr to t) which occurs on placing the reaction an an open water bath, in contrast to a covered water bath, as the result of an increased circulation of the liquid in the tubes. This again is governed by the difference between the temperature of the water bath and the temperature of the air, measured at the height of the upper edge of the liquid in the Sigma tubes. The difference between the temperature of the water bath and the temperature of the air above it was taken on a series of days and was ascertained to be 0·2°–0·4° C. for the covered water bath; whereas for the open water bath the temperature of the air fluctuated during the course of the 24 hours between 22° and 30°, so that the difference here amounted to 8°–15°. The temperature of the liquid in the tubes was about 37°.

5. *Fluctuations in the Temperature at which the Reaction is Carried Out.*—For both the S.R. and the S.-G.R. the temperature at which the reaction is to be carried out is fixed at 37° C., but it may sometimes happen that external circumstances may produce fluctuations in the temperature of shorter or longer duration, and as there are not, as far as I know, any investigations into the importance of this factor, I felt it might be useful to examine to what degree the reactions in question are sensitive to slight deviations from the prescribed temperature.

(*a*) *Sigma Reaction.*—The course of the reaction was examined at the following temperatures: 35°, 36°, 37°, 38°, 39°, and 41·5° C. For each serum all temperatures were examined simultaneously. The results are summarised in Table IV., and it will be seen that the S.R. is extremely sensitive to even very slight fluctuations in temperature.

TABLE IV.

Temp. (C.)	Σ units per c.cm. in serum No.—														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
35°	25	2·3	0·9	1·7	8·8	0·7	8·8	4·4	1·4	2·5	0·9	1·8	0·7	1·6	0·7
36°	—	31	28	31	34	16	—	—	—	3·1	2·8	—	1·7	—	1·3
37°	220	76	68	62	50	43	28	16·4	14	7·7	7·7	6·4	3·0	2·3	2·0
38°	—	85	76	72	65	44	—	—	—	8·1	7·7	—	3·4	—	2·2
39°	—	85	81	72	65	44	—	—	—	8·5	7·7	—	3·8	—	2·3
41 5	220	—	—	—	—	—	28	17·2	13	—	—	—	—	2·5	—

The reaction was certainly affected to a very slight degree by rising temperature—indeed, as far as some of the sera were concerned no difference could be shown in the strength of the reaction carried out at temperatures from 37° to 41·5° C.; on the other hand, if the temperature sinks below 37° C. it is quite another matter, as the capacity to react is already considerably weakened at 36° C., and at 35° C. all the sera react very weakly, and a large number not at all. It will also be seen from the table that the various sera are not equally sensitive to fluctuations in the temperature; for instance, Serum No. 3 gives 0·9 units per c.cm. at 35° and 81 units per c.cm. at 39° C., whilst No. 10 gives 2·5 and 8·5 units respectively. At 35° C. spontaneous flocculation often appears (from tr− to tr+), and likewise one often comes across several consecutive tubes with the same rather weak precipitation (inhibition zones). The calculation of the strength of the serum in units is in these cases not wholly reliable. As a basis for the calculation the tube which shows the greatest precipitation is always chosen, for instance, 1) 0, 2) tr−, 3) tr+, 4) tr−, 5) tr− = 3·8 units per c.cm.

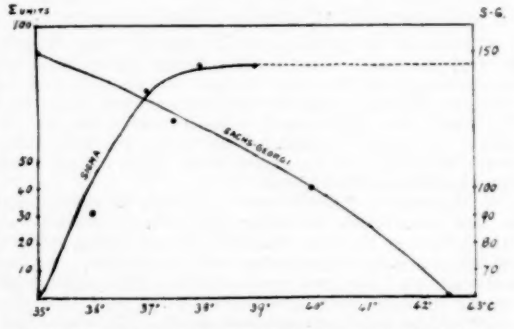
This enormous reduction of the titre of the serum at temperatures below 37° C. is, however, hardly solely due to any real decrease in the speed of the reaction, but rather to the fact that at the low temperatures marked inhibition zones appear so that the reaction is masked, as is seen from some experiments which are described later.

(*b*) *Sachs-Georgi Reaction.*—As it was impossible, the method of quantitative titrating being employed, to observe slight fluctuations in the strength of the reaction, only the following temperatures were tested: 35°, 37·5°, 40°, 42·5° C. All tests were placed in an electrically-heated and regulated incubator, and a control was kept with a maximum and minimum thermometer as to whether the temperature had remained constant during the experiment. The results of the experiment will be found in Table V.,

TABLE V.

Temp. (C.)	Serum No.—														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
35·0°	150	100	40	40	40	30	30	30	30	20	20	15	15	15	15
37·5°	125	100	40	20	30	30	30	30	30	20	20	15	15	12	12
40·0°	100	65	20	10	20	15	20	20	25	10	10	10	5	10	5
42·5°	60	35	10	5	10	5	10	7	15	5	5	5	0	5	0

from which it appears that the S.-G.R., in contrast to the S.R., goes well at 35° C., and that an increase of the temperature from 35° to 37·5° C. in some cases causes a slight weakness, but is generally without influence; if the temperature is raised from 37·5° to 40° C., this causes a considerable decrease in the strength of reaction, and this grows with increasing rapidity with every degree by which the temperature rises; at 42·5° C. most of the sera react negatively, or only slightly positively (±with 0·1 c.cm. serum). The S.R. and the S.-G.R. are thus both influenced by fluctuations in the temperature, but in diametrically opposite directions, as is clearly shown by the graph. What the cause of this may be has not yet been determined.



The lines represent the smoothed curve, while the points represent the actual observations.

6. *Immersion of Sigma Tubes in the Water Bath.*—Dreyer and Ward state in their paper that it is very important to arrange the level of the water in the bath so that not more than the lower half to two-thirds of the column of fluid in the tubes is immersed. But perhaps it might be of interest to determine the exact importance of this point. Of a number of sera several sets were pipetted, one of which was

placed in the covered water bath, one in a dry-air incubator, and four in an open water bath. By means of wooden blocks it was arranged that the column of liquid in the tubes of one group was wholly immersed, one was two-thirds immersed, one was half immersed, and one immersed one-third in the water. The result of the experiment will be seen from Table VI., which shows that the weakest reaction took place in the covered water bath; a slightly better result was obtained from the use of the dry-air incubator, there having been some circulation of the liquid in these tubes, produced by the evaporation of the liquid. By being placed in the open water bath, wholly immersed, the reaction

TABLE VI.

—	Σ units per c.cm. in Serum No.—							
	1	2	3	4	5	6	7	8
Water bath, *closed* ..	42	42	16·3	12·5	6·2	5·5	2·4	2·1
Dry-air incubator ..	54	54	17·2	14·7	6·8	6·8	2·8	2·3
Water bath, *open*—								
Wholly immersed ..	69	55	28	19·2	8·1	6·2	3·8	2·5
2/3 ,, ..	81	70	28	29	16·3	9·0	4·5	3·1
1/2 ,, ..	114	81	37	31	16·3	9·7	4·5	3·5
1/3 ,, ..	114	77	36	31	16·3	9·0	3·1	3·3

is strengthened somewhat, but a really strengthened reaction only appears when the column of liquid in the tubes is only partly immersed in the water. The maximum strength of the reactions was obtained in the tubes where the column of liquid had been *half* immersed; if only one-third of the column of liquid is immersed, the results in some cases are somewhat weaker. It is remarkable that some sera are affected much more than others by this "immersion phenomenon." The average increase of the strength of the reaction is round about 100 per cent.

Inhibition Zones.

In connexion with the experiments described above a number of observations were made which may serve to establish some of the factors which bring about the formation of the so-called inhibition zones. It has previously been observed that some extracts are more apt to give inhibition zones with some sera than others. Apart from the extract, the following factors may influence these formations: (1) The cholesterin; (2) the temperature of inactivation; (3) the temperature at which the reaction is made; (4) circulation of the liquid in the tubes.

That various kinds of cholesterin to various degrees influence the inhibition zone in some sera will be seen from the following examples:—

Cholesterin.	Tube No.—					
	1	2	3	4	5	6
Kahlbaum II. ..	tr	tr+	t	t	t−	s−
,, III. ..	s−	s+	t	t	t−	tr+
,, I. ..	s+	t	t	t	t−	tr+

Inactivating serves to remove the inhibition zones which most sera show in active state or after too brief inactivating. If the inactivating is done, however, at too high a temperature (over 54°–55° C.) the inhibition zone returns, as the following examples show:—

—	Tube No.—							
	1	2	3	4	5	6	7	8
Active ..	0	0	tr	tr+	s	t−	s+	tr+
Inactive—								
1½ at 54° C.	s+	t	t	t	t	t	s++	tr
,, 55° ,,	s−	t−	t	t	t	t	s++	tr
,, 56° ,,	0	tr+	t	t	t	t−	s+	tr−
,, 57° ,,	0	0	tr	t−	t	t−	s−	tr?

That the temperature at which the reaction is carried out plays an important part in the formation of inhibition zones appears from the following:—

Temp. (C.)	Tube No.—						
	1	2	3	4	5	6	7
35°	0	tr−	tr	tr	tr−	tr−	
36°	tr−	tr	tr+	t−	tr+	tr?	
37°	tr−	tr+	t−	t	t÷	s−	tr?
38°	tr	tr+	t−	t	t−	s(−)	tr?
39°	tr+	s−	t	t	t−	s(−)	tr?

Temp (C.)	Tube No.—							
	1	2	3	4	5	6	7	8
35°	tr−	tr−	tr−	s+	s−	tr		
37°	tr+	s+	t	t	t	t	t−	s−
41·5°	t	t	t	t	t	t	t−	s−

These examples show that the very marked inhibition zone at 35° and 36° C. gradually disappears with increasing temperature and at 39°–41·5° has quite disappeared. This makes it probable that the enormous reduction of the reactive capacity which takes place when the temperature sinks from 37° to 35° is principally due to the formation of an inhibition zone which totally masks the reaction and only produces in a lesser degree a real decrease in the velocity of the reaction.

The importance of a strong circulation in the tubes (adjustment of the water level in the water bath) appears from the following:—

—	Tube No.—					
	1	2	3	4	5	6
Water bath, closed ..	0	tr+	s+	s	tr	
Dry-air incubator ..	0	tr+	t−	s+	tr+	
Water bath, open—						
1/1 immersed ..	tr+	s+	t−	t−	s−	tr?
2/3 ,, ...	s+	t	t	t−	s+	tr
1/2 ,, ...	t	t	t	t	s+	tr

Conclusions.

1. Various specimens of cholesterins, even from the same makers, are not identical with regard to their ability to strengthen the S.R.

2. Inactivation of sera for the S.R. in tubes closed with rubber or cork or sealed in the flame may sometimes bring about some weakening of the reaction. In the case of the S.-G.R. this could not be established.

3. Even slight variations in the temperature at which inactivation is carried out will influence the strength of both the S.R. and the S.-G.R. The rate of the weakening of the strength of the serum is greatly increased for every degree that the temperature is raised above 54° C.

4. When the S.R. is carried out in a closed water bath, a much weaker reaction is obtained than when an open water bath is used.

5. Fluctuations in the temperature at which the S.R. and S.-G.R. are made have a very great influence upon the result of the reaction. In the case of the S.R., temperatures *below* 37° C. are fatal; in the S.-G.R., the same is the case with temperatures *above* 37·5° C.

6. It is of the greatest importance that the adjustment of the water-level in the water bath, so strongly emphasised by Dreyer and Ward, should be exactly adhered to.

7. A number of different factors can give rise to the formation of inhibition zones.

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ON AN IMPROVED PROPHYLACTIC METHOD OF TREATMENT OF ECLAMPSIA.[1]

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AT the Battle of Trafalgar the British navy lost 1690 men, killed and wounded, whereas, according to Thomas Watts Eden, during the period of ten years from 1910 to 1920 there died through eclampsia in Great Britain and Ireland on the average 630 mothers per annum (22·5 per cent. of the cases) and double this number of children (47·8 per cent.). In other words, the loss of human lives during this period from eclampsia was higher than in that great battle.

It appears that in America the mortality from eclampsia is still greater. Leighton states that the death-rate in nine of the chief gynæcological institutions for five years reached 38·4 per cent. Rickets states that in U.S.A. 4000 mothers die annually of eclampsia, whilst, according to Coles Stricker, the average number of cases in that country amounts to 7500 per annum. If these figures are correct, the mortality reaches the enormous figure of 53·5 per cent. Hammerschlag also points out that the mortality from eclampsia in the United States is higher than in Europe. Whereas, in Paris, Berlin, Budapest, and Milan the mortality from eclampsia was about 1 to each 1000 deaths amongst women, in Chicago the proportion was 1·9, in San Francisco 2·9, and in New Orleans even 6·4 among the whites and 3·4 among the coloured population. There is reason to believe that the application of the improved prophylactic method of treatment of this disease will diminish the mortality by at least half.

History of the Method.

I first applied the method detailed later in 1897 and had no deaths from eclampsia in the first 57 cases. At the International Congresses in Paris (1900) and in Rome (1902) I reported 92 and 126 cases of eclampsia respectively with a mortality of 5 to 6 per cent. In 1907 I visited Rosthorn's clinic in Heidelberg and successfully treated a case who had had 11 fits in the course of 9¼ hours and coma, with a pulse-rate of 150. Excellent results were obtained by me in 1909 in the clinics of Profs. Schauta and Piscacek (in Vienna), and in 1911 in the clinics of Profs. Bumm and Franz (Berlin). In 1908 I was able to report on 360 cases of eclampsia with a maternal mortality of 6·6 per cent. and a child mortality of 21·6 per cent. (the latter being eclampsias sub partu). Prof. Leopold, in Dresden, first applied my method in 1909, and obtained excellent results on 50 patients, out of which only four with complications died; 34 per cent. had no fits from the moment when treatment began, whilst 50 per cent. had only one to three fits.

The second to adopt my method in Germany was Prof. Krönig in Freiburg, whose five cases of eclampsia were completely satisfactory both as regards the mothers and the children. Since then this method spread further in Germany, in Switzerland (Herff), in Holland (Mingelen), in Sweden (Forssner), and even in the far Argentine (Enricque Zarate).

In 1918 I was able to collect from the literature—which is far from complete—2208 cases of eclampsia treated by this method and its variations, with a total maternal mortality of 9·8 per cent. Amongst 878 children born from eclamptic mothers, whose history is recorded, the mortality after treatment by this method was about 12 per cent. lower than in cases treated by other methods in the same clinics. Acting on behalf of Prof. Hinselmann, Dr. Weinsenfels discovered 1094 more cases up to 1924, which raises the number of cases to *3302, of which 357—i.e., 10·8 per cent.—terminated fatally.*

Still better results were obtained by us during the last 10–12 years after the method was somewhat modified. Out of 253 cases of eclampsia with fits at the State Clinical Institute of Obstetrics and Gynæcology (during 9¼ years), and the Krassovsky Lying-in Hospital (from 1910 to 1921, when it was closed) only six deaths—i.e., 2·4 per cent.—were observed. In three of these cases we were dealing with hopeless patients. In one case we were unable to apply the prophylactic treatment in the absence of chloral hydrate, and in two cases of relatively light eclampsia death resulted from pneumonia and septicæmia. Thus, we had not a single death from eclampsia in cases that had not been neglected, and obtained figures regarding which Dr. Fürst [2] justly remarks: "In the statistics of the whole literature these favourable results stand out unsurpassed."

The Secondary Effects of the Treatment.

The beneficent effect of this treatment is confirmed by a series of other facts.

Thus, (1) *the number of fits diminished markedly.* In the course of the last ten years we obtained immediate cessation of the fits after the treatment was commenced in 40 per cent. of cases. In 45 per cent. the fits were repeated from one to three times, and only in 15 per cent. they were more numerous.

(2) *There is a large number of "intercurrent" eclampsias—i.e., cases in which there is freedom from fits for 12 hours and more before delivery.* Formerly, there were from 21 to 27 per cent. of such cases in prophylactic treatment. In the last group treated they amounted to 40·9 per cent. These figures do not, however, sufficiently characterise the power of the method in checking the fits, since many eclamptic patients are delivered in less than 12 hours after cessation of the fits. The efficacy of the method is more distinctly exhibited in cases of eclampsia sub graviditate; since 1916 66 per cent. of such eclampsias manifested an intercurrent course. This is a great advantage, since the pregnancy progresses after cessation of the fits and the child is delivered mature.

(3) *Psychical disturbances* are few in number and of a mild character. Out of 253 cases of eclampsia there were only four—i.e., 1·6 per cent. In one case the patient had five fits and after delivery suffered from nephritis, when mild symptoms of psychosis were observed for some days. In another patient, who had only one fit sub graviditate in the post-partum period, symptoms of icterus gravis were observed, in connexion with which psychosis was observed for several days. Recovery followed.

(4) *The mortality of children is relatively favourable.* For the whole group it amounts to 14·3 per cent., for eclampsia sub partu et sub graviditate 20 per cent., and for post-partum cases 6·2 per cent. The most interesting group for us are the eclampsias ante partum and intra-partum, since in these the action of the drugs upon the fœtus is manifested. The mortality in this group was 20·1 per cent., but if the premature children (weighing less than 2000 g.), which died before treatment was commenced, from cold, operation, &c., are excluded, there remain only 6 per cent. attributable to eclampsia and treatment. And since 6·2 per cent. of fœtuses also perished in post-partum eclampsias, very little remains to the share of drugs.

(5) For the whole group of 253 eclampsias there was not a single death of the mother due to treatment. As is known, in the method of treatment of eclampsia by forced delivery some mothers die as the result of operation. In Bumm and Franz's cases about 4 per cent. of women died in consequence of operation.

(6) Diminution in the number of operative deliveries. These amounted to 56 per cent.

(7) Few cases of pneumonia.—4 in 253 patients.

(8) Rapid recovery of the patients.

On the basis of these 253 eclampsias, as well as of the analysis of the preceding 570 cases treated by the less perfect variety of the prophylactic method, I have arrived at the conclusion that a favourable

[1] Being a paper read at the Section of Obstetrics and Gynæcology of the Royal Society of Medicine on July 3rd, 1924.

[2] Zentralbl. f. gynäk., 1924, No. 16, 843.

prognosis can be given for the mother in cases of eclampsia that have not been neglected.

An extremely interesting confirmation of this is presented by the immense monograph on eclampsia by Prof. Hinselmann, of Bonn, in collaboration with 12 other specialists. He praises highly the great efficiency of this method, and points out that if my figures are achieved by others using my method the problem of the treatment of eclampsia may be regarded as solved. One may hope that the British and American cases of eclampsia are not more intractable than the Russian and German ones.

Proposals for trial in England.

I would like to verify the method in this country and possibly improve the details; at the same time it is my desire to collect the 47 cases to make up a total of 300 treated by this method.

1. The first condition necessary for a trial of my method would be to give me the opportunity of taking part in the treatment of as many cases of eclampsia occurring during the next 1½–2 months of my sojourn in London, as possible. The authorities could perhaps select four or five lying-in institutions in London and request their directors to provide me with the necessary material. It is important to provide for this purpose a separate hygienic room.

2. The exact application of the method is only possible with the help of an experienced qualified assistant who has a knowledge of the method. It is also necessary to have a midwife capable of looking after the eclamptic patient according to the requirements of the method. If a nurse is available, she also should be instructed accordingly. If it were possible to choose these persons beforehand, I would speak to them and instruct them in the technical part of the process. Of course, it is important to have the necessary medicaments and instruments always ready (morphine, chloral, chloroform, oxygen, digitalis, instruments for venesection and for delivery).

3. I consider the demand of T. W. Eden that eclampsias should be classified as mild, severe, and moribund to be very important. To the seven features by which he characterises the severe cases I would add the following two—nephritis of long duration and fits recurring four or more times during two hours. It would seem to me desirable to establish another category of severe cases; those manifesting two-thirds of the symptoms of severity should be referred to as morituræ, or very severe cases, with an additional symptom—*presence of cerebral hæmorrhage.*

4. Considering the importance of this experiment not only in England but in all civilised countries, it would be desirable to establish a special committee for the exact estimation and observation of the cases. Such a committee would naturally be composed of the directors of the lying-in departments of the coöperating institutions, presided over by a person selected by the Section of Obstetrics and Gynæcology of the Royal Society of Medicine.

I am prepared to present myself to take part in the treatment of cases by day and by night.

The Scheme of the Method.

The following is the brief scheme of the method of treatment which is more fully described elsewhere.[3]

Eclamptic patients in most cases die from the destructive action of the fits upon the heart, respiratory centre, &c. Therefore the fits must be repressed. Eclampsias sub graviditate and eclampsias sub partu are treated with equal energy. Post-partum eclampsias have a milder course, and therefore in most cases require the administration of smaller doses of narcotics. Sometimes they are extremely severe and then require maximum doses. During the fits the patient should be protected against injuries, the tongue protected against bites, and oxygen should be given after fits to remove asphyxia. Chloroform is harmful in typical fits, but if the patient is breathing (clonic convulsions) it is useful.

1. *Removal of all irritations:* (*a*) All noise to be eliminated, (*b*) room darkened, (*c*) examinations reduced to a minimum, (*d*) if possible, separate room and constant observation. Transfer to room under chloroform.

2. *Administration of narcotics:* Morphine and chloral hydrate according to scheme below.

The beginning of treatment: ¼ gr. (⅛–¼ gr.) morph. hyd. hypodermically. 1 hour: 30 gr. (38–22 gr.) chlor. hydr. per os or per rectum. 3 hours from the beginning of the treatment: from ¼ gr. (⅛–¼ gr.) morph. hyd. hypodermically. 7 hours: As at 1 hour. 13 hours: 22 gr. (15–30 gr.) chlor. hydr. 21 hours: 22 gr. (15–30 gr.) chlor. hydr. Dose increased in severe eclampsia in the case of strong individuals, and diminished in mild forms. When patient is conscious chloral hydrate is introduced per os, and in unconscious condition per rectum with milk and physiological salt solution. During the first two intervals we frequently administer chloroform 10–20 minims in the presence of prodromata of a fit. On the second day undelivered patients receive 15–22 gr. chlor. hydr. t.i.d. In the absence of fits during 14 hours and when the patient is in good condition the dosage may be diminished.

3. If the fit recurs two to three times, or even once in severe form, in spite of administration of morphine and chloral hydrate, it is necessary to perform venesection, drawing off 400 c.cm. of blood. This is not resorted to if delivery is expected within the next 1–2 hours.

4. As soon as the eclamptic patient can be delivered without harm to herself and child, delivery is undertaken, either with forceps, by extraction, or rarely, by version. In the absence of contra-indications we rupture the bag of membranes, if the os has dilated to two fingers in a multipara, and about three fingers in a primipara.

5. *Maintenance of regular functions of chief organs:*—

(*a*) Kidneys and skin: Patient kept warm with hot water bottles at the feet and in the region of the kidneys; hot tea diluted with milk should be given; unconscious patients must have milk and physiological salt solution āā (about 1000 c.c. per diem), usually with chloral hydrate, per rectum.

(*b*) Lungs: Oxygen after a fit, pure warm air, removal of all hindrances to respiratory movements; unconscious eclamptic patients should be kept chiefly on the right side; careful cleansing of the mouth and nose from mucus, blood, and vomited matter.

(*c*) Heart: Administration of fluids (see (*a*)), when weakened after numerous fits—digitalis (if the pulse-rate is 110 or higher)—and when the heart is still weaker—camphor, caffein. Patients admitted from outside after six or more fits immediately undergo narcotic treatment and venesection. Continuous observation of patient and child during the first 24 hours after delivery. In very severe cases 135 gr. chlor. hydr. and ⅔ gr. morph. hyd. are introduced in the course of 14 hours (the administration of narcotics is much more frequent than is shown in the scheme, until the fits cease) + chloroform narcosis several times. The forerunners of a fit are: increase of headache (which is recognisable in unconscious patients by the expression of the face, restlessness in bed), convulsive contractions, dimming of vision, and especially increase of blood pressure.

I may express my confidence that all the light cases of eclampsia will recover if the method is applied in the proper manner; the severe cases also should not prove fatal provided they do not contract pneumonia or sepsis. If this experiment resulted in the saving of even a few lives I would consider myself perfectly satisfied. It will, however, be of still greater benefit in the future.

In conclusion, I would like to express my deep gratitude to the Society for its willingness to render assistance in the elucidation of a problem which has hitherto produced so few results, in spite of the work of numerous scientists during two centuries.

[3] Journal of Obstetrics and Gynæcology of the British Empire. Vol. 30, No. 1, 1923.

ANÆSTHESIA FOR SHORT OPERATIONS ON CHILDREN.

BY O. STUART THOMPSON, L.R.C.P. LOND.,
CLIN. ASSIST., OUT-PATIENTS, AND LATE ASSISTANT CASUALTY OFFICER, HOSPITAL FOR SICK CHILDREN, GT. ORMOND-ST., LONDON.

THE choice of an anæsthetic must always rest with the anæsthetist who takes the responsibility of administering it, and in the case of an adult a skilled administrator will employ any of the usual anæsthetics with equal safety and without injurious effects to the patient afterwards. With children the matter is rather different.

When working in the out-patient department of the Hospital for Sick Children, Great Ormond-street, I particularly noticed two post-operative or, as I am inclined to believe, post-anæsthetic conditions: (1) An undesirable amount of collapse immediately following

such minor operations as dissection of tonsils, &c.; (2) a fear of the doctor afterwards.

From the anæsthetist's point of view, children may be divided into two classes: (*a*) Those who take the anæsthetic quietly, and (*b*) those who will not take it unless it is forced on them. The first class includes those children who are very ill, and, though it used to be taught that "children take gas badly," it will be found by experience that they take gas and oxygen well. It is now given almost as a routine at the Hospital for Sick Children in cases of hypertrophic pyloric stenosis, and the results of operation in these cases are encouragingly successful. It is a form of anæsthesia that might be more frequently employed for children.

It is the second class of child that I particularly wish to consider. The anæsthetist who also does private practice will have the opportunity to study the after-effects of anæsthesia on children, and if he has to treat the children afterwards, he must soon realise the harm caused by the administration of an anæsthetic through shock and the subsequent fear of the doctor; this is sometimes so great that it is almost impossible to do anything with the child for a year or more.

To avoid these two after-results, I consider the most important thing to do is to shorten the period of induction. The drug that produces anæsthesia most rapidly is ethyl chloride, and this, followed up with ether, I believe to be the best form of anæsthetic for these children at present. It was said to me by a well-known anæsthetist that a drug that produces anæsthesia so rapidly must *ipso facto* be a dangerous drug to use. In the hands of an indifferent administrator this is doubtless true; but experience teaches us everything, and in a series of 10,000 administrations of ethyl chloride given in our dental department no bad effects were noticed. On the strength of this, I used ethyl chloride followed by open ether in a series of 200 cases in the out-patient theatre without observing any ill-effects or alarming symptoms or having any difficulty in the administration.

I give ethyl chloride on an open mask, the amount used being about 3 c.cm. for a child of 5 years old. It is sprayed on the mask, which is immediately applied over the face and is followed by open ether later on. The child is instructed to blow it away, and four "blows" with the inspirations that accompany them are usually sufficient to produce loss of consciousness. The child seldom struggles, and even if it does there is no prolonged induction period—the time being only a few seconds—and consequently there is little recollection afterwards of the struggle with the anæsthetist, and less fear of "the doctor," so that one can still do something with the child again.

It is quite possible to get a child under the anæsthetic rapidly with open ether, but it means "pushing" the anæsthetic, and anyone who has had the experience of breathing with a large amount of ether on the mask knows how extremely unpleasant it is. I can vouch for this from personal experience. With the avoidance of a prolonged induction period, I have noticed less shock following short operations. This shock, in the case of such short operations as are done in an out-patient theatre, I am therefore inclined to regard as post-anæsthetic rather than as post-operative.

The question of administration of an anæsthetic to a child is not complete without reference to the handling of the child and the obtaining of the child's confidence. This is just as important for the anæsthetist as for the physician. Children should never be forced to lie down suddenly, it nearly always frightens them, and if the mask is clapped over the face and ether forced on to them, it is long before they recover their confidence in a doctor. If the anæsthetist had to treat these frightened children he would realise the importance of the careful handling of a child.

As regards chloroform, I do not intend to enter into any discussion as to its comparative merits, or to resuscitate the tedious ether-versus-chloroform controversy. I give children chloroform when necessary, and will admit that it produces a gentle anæsthesia, but I have never liked it for children.

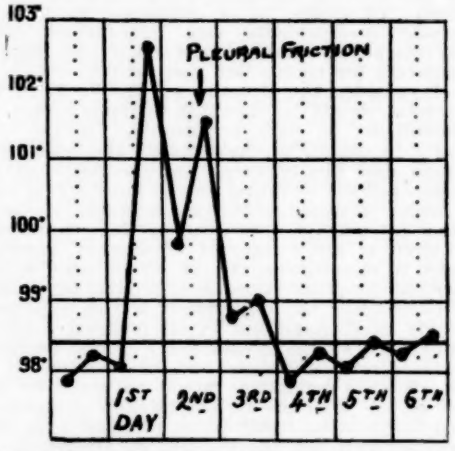
Clinical and Laboratory Notes.

EPIDEMIC PLEURISY.

BY BRUCE WILLIAMSON, M.B., CH.B. EDIN.,
HOUSE PHYSICIAN, PADDINGTON GREEN CHILDREN'S HOSPITAL.

THE following is a brief account of a small epidemic of pyrexia, associated with dry pleurisy, which occurred during the month of June in the country branch of the Paddington Green Children's Hospital. It can only be described as an acute onset of pyrexia, lasting three or four days, associated with the development of a dry pleurisy which becomes evident usually on the second day of the fever. The ætiology is unknown. In all, 13 cases have come to my notice, of these three were among the nursing staff and the remainder children of varying ages, from 4 months to 8 years.

The incubation period appears to be short, probably under a week. It was noticeable during the outbreak that fresh cases occurred usually in groups of three, at three to five day intervals, and all have been so remarkably alike in onset, symptoms, and progress that there is little room to doubt that the illness is a definite clinical entity. The onset in all cases was abrupt and ushered in by a feeling of chilliness, a complaint of mild headache associated with a feeling of being out of sorts, and general aches all over the body, less severe than those associated with influenza. Such were the symptoms described by the adult patients, and probably also present in the younger cases. Within an hour or two the temperature began



to rise and soon reached 102° F., and the pulse-rate increased to 120 or more, the younger patients being 20 to 40 beats higher. The respiratory-rate increased, and the whole picture closely resembled the onset of pneumonia. During the next 24 hours the pyrexia was maintained and might even touch 104°. Amongst the younger patients two had moderate diarrhœa. Examination on the first day revealed no signs of any inflammatory process in the lungs or elsewhere. On the second day the temperature fell slightly, but a secondary rise occurred the next day. It was on the second day, as a rule, that the patient complained of a catching pain on breathing, and the characteristic pleural friction of a dry pleurisy was heard. The area over which it was heard was generally confined to a very circumscribed single area at one base, more often in the axillary line. By the fourth day the fever had subsided and the pulse and temperature were again normal, the pleural friction and its associated pain remaining for a day or two longer and constituting the sole sign and symptom. A week after the onset the pleural rub had disappeared and none of the cases in this series has been complicated by fluid, nor has there been evidence of lung

implication at any time. In two cases a marked sudaminal rash, generalised over the body, followed the fall of temperature.

With regard to this series daily examination has not been always available, and in only seven out of the 13 cases was the presence of pleural friction established, these seven being all children. But there is little doubt as to its presence in the three adult cases, members of the nursing staff, who described the typical pain associated with the inspiratory effort, and they were aware that they had pleurisy. All the children complained of pain in the side, with the exception of the infant of 4 months, in whom it may have been present as she was extremely fretful and cried continuously for a day. The temperature chart and pulse were similar, and the duration practically identical in all cases.

RUPTURE OF THE RECTUS ABDOMINIS PRODUCED BY VOMITING.

BY JOHN WHITTINGDALE, M.B. CAMB., F.R.C.S. ENG.

SPONTANEOUS rupture of the rectus abdominis muscles may occur as the result of great and prolonged contraction during labour, or of violent convulsive spasms produced by the action of strychnine and of tetanus toxin upon the spinal cord. The case here reported presents the following features of interest: (1) Predisposing causes—advanced age and debilitated condition of the patient, (2) exciting cause—violent vomiting, (3) difficulty of diagnosis and unexpectedness of the condition found at operation.

The patient, a charwoman, aged 74 years, had been confined to her house suffering from gradually progressive myocardial failure.

History.—She had had 12 children and was able to do house-work until the age of 73. When first seen on Sept. 10th, 1923, she complained of difficulty in breathing, cough, and swelling of the legs, with cyanosis of lips, pulsating veins in the neck, irregular radial pulse, and moist sounds audible over both lungs. The abdominal wall was flaccid and the colon visibly distended and tympanitic. There was tenderness over the hepatic area of the abdomen. The urine was scanty and contained albumin. Ten minim doses of tincture of digitalis with 5 gr. of ammon. carb. were given four-hourly. Sept. 12th: Complained of diarrhœa. Digitalis replaced by 5 minim doses of tinct. strophanthi. 16th: Vomited three times, with cramp-like pains over abdomen. Strophanthus stopped and hot flannels applied. 18th, 8 P.M.: Vomited all day. Sudden violent pain in right iliac region with a sensation as if something had given way. Complete constipation with retention of urine. Abdomen distended and tympanitic and muscles over right iliac region tender and rigid.

The patient was now very collapsed and apparently moribund. A diagnosis of mesenteric embolism was suggested and operation was not advised, as the patient did not seem likely to survive the journey to hospital. A hypodermic injection of morphine and atropine was given. Sept. 19th: Patient much better, retained water, tea, and jelly; complained of lump in right side of abdomen. On examination, a large swelling was found occupying the right half of the abdomen, extending from the symphysis pubis to the right hypochondrium; the overlying skin showed ecchymosis. The mass was pyriform in shape with well-defined borders; of solid consistence and tender to touch. Patient was removed by car to the Yeatman Hospital, Sherborne, a journey of eight miles.

Operation (20*th*).—Under chloroform a right paramedian incision was made extending from the symphysis pubis to the umbilicus. The superficial fascia was œdematous. On opening the anterior layer of the sheath of the rectus blood-clot escaped and a large ragged cavity was found in the substance of the muscle from which 6 oz. of blood and clot were evacuated. This was treated with spirit and bipp. It was then obliterated as far as possible with interrupted catgut sutures. The anterior layer of the sheath and the skin incision were closed without drainage. The wound healed per primam and the patient returned home on Oct. 8th.

On discharge, the patient was comfortable and showed no sign of myocardial embarrassment as long as she remained in her chair. The œdema of the feet and legs had disappeared and the breath sounds were clear.

It is worthy of note that in spite of the advanced age of the patient and the considerable degree of shock to which she was subjected, the ultimate result was an amelioration of her general condition.

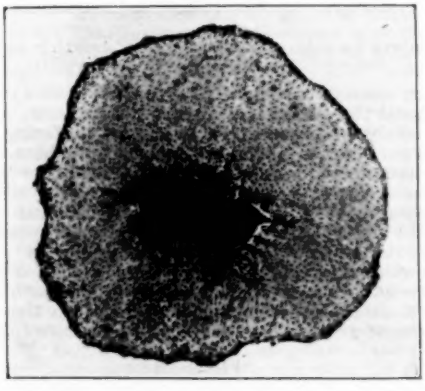
THE GROWTH OF MAMMALIAN TISSUES IN PURE SERUM.

BY THOMAS LUMSDEN, M.D. ABERD.
(*From the Department of Experimental Pathology, Lister Institute.*)

Carrel and Ebeling[1] have succeeded in growing chicken fibroblasts in vitro for over 12 years, but no medium has yet been discovered in which mammalian tissues or a pure strain of glandular epithelium can be grown indefinitely. Mammalian tissues do, however, grow vigorously for some weeks in vitro, but the media employed have been very complex and the methods troublesome. Dr. A. H. Drew, who kindly showed me his technique, uses a mixture of (1) modified Locke's fluid, (2) embryo extract, (3) serum, and (4) autolysed tissue extract. He tells me that the shortest time in which anyone has yet become proficient in this technique is four months.

The purpose of this note is to indicate that equally if not more vigorous growth (Fig. 1) may be obtained

FIG. 1.



Young rat kidney (× 30). Three days' growth in pure rat serum.

in pure serum alone, providing that certain essential precautions are taken. The first of these is that the serum must be absolutely sterile, and the second, scarcely less important, is that its pH must not exceed 7·7.

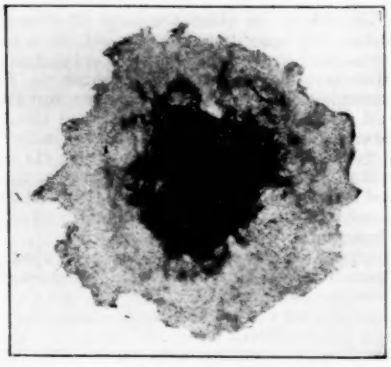
It is, I suppose, common knowledge that if serum is freely exposed to the air it rapidly gives off CO_2, so that if when first exposed its pH was 7·5, in five or ten minutes the pH will be 8 or over. This being so, it is essential either to prevent this loss of CO_2 or to replace it by exposing the serum to an atmosphere of 5 per cent. CO_2 in air for 10 to 15 minutes. There are some other variable factors in the serum and in the tissue which I am attempting to ascertain, but if the serum is sterile and of optimal reaction (pH 7·5 or so) then from 80 to 100 per cent. of successes may be anticipated. The use of pure serum obviates the need for embryo and autolysed tissue extracts, and for the use of filters, ice, &c. The simplification in the technique is so great that anyone trained to asepsis can obtain vigorous growth after a week's practice.

Technique.—The blood is drawn from the heart of a half-grown animal as quickly as possible, and is at once poured into a centrifuge tube, which is tightly corked. After separation of the clot and centrifuging, the serum is transferred rapidly, and with rigid aseptic precautions, to a series of capillary tubules made of resistant glass; these are immediately sealed up. The pH of the serum now remains practically constant and should be 7·5 or 7·6. It can be used as a culture-medium for several weeks at least. Hetero-

[1] Jour. Exp. Med., 1913, 1919, 1922.

logous serum appears to act almost as well as homologous. (Fig. 3.) The tissue used was almost invariably the kidney of a rat three to four days old, but heart, spleen, testis, cartilage, &c., also grow in serum alone. There is no magical dividing line between born and

FIG. 2.



Embryo rat kidney (× 15). Six days' growth in serum and autolysed tissue extract (equal parts).

unborn animals in regard to growth, but the younger the tissue the earlier it begins to grow. Both embryo and autolysed tissue extracts have a buffering effect on serum; up to now I have seen no evidence that they have (on mammalian tissues) any other action. I have not found that re-feeding growing cells with autolysed tissue extract had any harmful effect. (Fig. 2.) All growing tissues require to be re-fed with fresh serum daily or at least every second day.

Growth takes place either in the form of a carpet of cells adhering to the cover-glass or in spheroidal form if adhesion has not occurred; often these two varieties of growth coexist. The newly forming cells

FIG. 3.

Young rat kidney (× 37½). Grown in rabbit serum for five days, showing junction of two carpets originally separate.

appear to feed on the serum constituents, for I have been able to remove the old fragment completely; the carpet of new cells left behind generally shrivels, but from the shrivelled mass a new carpet of freshly-growing cells may develop.

Cells only grow actively if anchored in some way —e.g., to the cover-glass, to a foreign body (cotton fibre or such like), or the original fragment may be the point d'appui.

If injured mechanically or if fed with an unsatisfactory medium, the growth may become partially detached from the coverslip and shrivel rapidly, assuming a lace-like or sometimes a tubular appearance. Even if the medium is apparently satisfactory, new cells tend to shrink and become fatty after four or five days; the first carpet may disintegrate, but a new one soon replaces it, and so growth continues for three or four weeks with a "wave-length" of a few days.

Medical Societies.

EDINBURGH OBSTETRICAL SOCIETY.

AT a meeting of this Society held on June 4th, Prof. B. P. WATSON, the President, being in the chair, Dr. FRANCIS J. BROWNE read a communication on

Further Observations on the Prevention of Antenatal, Intranatal, and Neonatal Death.

Dr. Browne explained that his paper was based on 200 consecutive cases of stillbirth occurring in fœtuses of viable age. The method of investigation was the same in each case—a complete post-mortem examination of the fœtus or infant and placenta was made, including a microscopical investigation of the organs, and the case-history was obtained. The mother was then examined and questioned regarding her family and personal history, and when possible the father was also questioned. From the information thus obtained an attempt was made to arrive at a decision as to the cause of death and to draw conclusions of practical importance regarding the management of pregnancy and labour. In a previous paper read to the Society, Dr. Browne had classified the causes of death under ten headings, such as craniotomy, asphyxia, or syphilis, &c., but in this series of cases he had adopted a new classification which possessed certain advantages over his former one. He divided the causes of death into three sections: antenatal, intranatal, and neonatal, and these were further subdivided into several groups.

Antenatal Death.

The causes of antenatal death had been classified as follows: 1. Toxæmic: (*a*) syphilis, (*b*) placental infarction, (*c*) utero-placental apoplexy, (*d*) premature senility of the placenta, (*e*) maternal glycosuria, (*f*) eclamptic convulsions, (*g*) drugs. 2. Mechanical: (*a*) placental separation in placenta prævia, (*b*) placental separation from trauma, (*c*) knots or torsion of the cord. 3. Developmental: (*a*) one artery in the cord (?), (*b*) small placental area, (*c*) general œdema of the fœtus, (*d*) other congenital abnormalities. 4. Undetermined: Syphilis was found to be the most frequent cause of antenatal death occurring in 24 cases, but in only 15 of these was the spirochæte demonstrated. In attempting to diagnose the cause of death in the macerated fœtus little in the external appearances was of help except that the abdomen might be prominent in the syphilitic fœtus on account of the large liver. Internally, the liver in the syphilitic fœtus was found to be of firm consistence owing to the presence of a dense framework when cirrhosis was present, and often of a greyish-brown colour, and the organ enlarged. In the non-syphilitic liver there was little fibrous tissue; the organ was extremely cellular, its glycogen content was large, and maceration resulted in a rapid diminution of its size. A normal fresh liver might weigh as much as one-twelfth of the body-weight; anything over this was probably syphilitic, and the spleen of a normal fresh fœtus might weigh one one-fiftieth of the body-weight. Any weight ratio over 150 was probably an evidence of syphilis. Dr. Browne had found that in the case of a fresh fœtus at the eighth month or over the weight ratio of the placenta might vary normally between 4 and 16, but that a ratio above 4 was abnormal provided there was no abnormal intra-placental clotting (red or white infarcts). Below the eighth month this rule did not hold and a ratio of two or even one or less might be looked upon as normal. Dr. Browne had never seen red infarcts in a syphilitic placenta, and this was of interest because whatever the explanation of infarct formation, the syphilitic placenta above all others was the one in which obliterating endarteritis of the fœtal vessels was found. In albuminuria of pregnancy or chronic nephritis, red and white infarcts were extremely common. In the speaker's experience

the presence of a strongly positive Wassermann reaction was very decisive evidence of the presence of syphilis in a pregnant woman. There was no doubt also that a woman might have a persistently negative Wassermann reaction and yet produce a succession of syphilitic fœtuses, but Dr. Browne had never met with a case in which a mother with a negative Wassermann produced a spirochæte positive fœtus. This, of course, raised the question as to how far it is justifiable to diagnose syphilis of the fœtus from the so-called secondary signs—viz., enlarged liver, spleen, and placenta. In doubtful cases there was also always the therapeutic test, and full courses of N.A.B. might be given to the mother. Maternal glycosuria was a rare cause of fœtal death. At present the prevention of antenatal death was practically limited to cases of albuminuria and syphilis, and in Dr. Browne's opinion about 60 per cent. of his cases might have been prevented by adequate antenatal supervision.

Intranatal Death.

Dr. Browne classified the causes as follows: Traumatic: (*a*) craniotomy, (*b*) cerebral hæmorrhage, (*c*) asphyxia, (*d*) suprarenal hæmorrhage, (*e*) other injuries. 2. Infective: pneumonia. 3. Toxæmic: scopolo-morphine narcosis. 4. Developmental. 5. Undetermined. Amongst these cases asphyxia accounted for more than half the total. Craniotomy was performed in 14 cases of the 200. In five of the 14 cases there was catarrhal pneumonia present.

Considering cerebral hæmorrhage, Dr. Browne pointed out that it was entirely a matter of the site and degree of hæmorrhage whether death took place during or shortly after birth. Referring to the hæmorrhagic diathesis, attention to which had been drawn by Warwick, the speaker said that, though he had seen no case in which it was necessary to assume the presence of this diathesis in his first series of cases, since then he had come across two cases which might be placed in this category. Breech delivery was ten times more likely to give rise to cerebral hæmorrhage as is delivery by the vertex. Dr. Browne then described in detail the ætiology of cerebral hæmorrhage in his cases. It was probable that undue haste in delivery of the after-coming head was responsible for many of the injuries. The unborn child could apparently bear the cutting off of its oxygen-supply for a much longer period than an adult and might be left undelivered after birth of the breech for as long as 20 minutes without injury. Potter, out of his great experience of breech deliveries, had said that instead of using forceful haste we must be deliberate and deliver gently and gradually the after-coming head. The points to be observed in the prevention of cerebral hæmorrhage were: (*a*) avoidance of breech deliveries by the performance of external cephalic version about the commencement of the ninth month; (*b*) the avoidance as far as possible of difficult forceps deliveries, and also hasty delivery; and (*c*) the limitation of induction of labour to cases which have completed the thirty-fifth week. A study of 36 cases of intrapartum asphyxia revealed the fact that about 75 per cent. might reasonably be classed as preventable. There was no doubt that many cases of asphyxia which occurred during prolonged labour, natural or otherwise, could be prevented by the induction of labour about ten days before term.

The value of the hydrostatic test for live birth was then discussed, and certain fallacies, such as artificial respiration, pointed out. But apart from these it was evident the lungs were not infrequently more or less inflated in infants that had unquestionably been born dead, and in whom no method of artificial respiration had been carried out. Dr. Browne expressed his entire agreement with the statement in Taylor's "Medical Jurisprudence" that "for respiration however complete or incomplete to be considered proof of live birth, an eye-witness to these respirations is essential." In his two series of cases there were 27 cases in which suprarenal hæmorrhage was the cause of death and in this connexion, he said, three facts stood out—viz., its frequent association with asphyxia, its greater liability to occur in the right gland, and its greater frequency during breech delivery. Suprarenal hæmorrhage was probably caused by the backward pressure of blood in the inferior vena cava found in asphyxia and by the compression of the latter between the liver and vertebral column in breech delivery.

Neonatal Death.

Of this there were in his present series 73 cases, and the many causes were classified under traumatic, infective, prematurity, toxæmic, developmental, and other conditions not peculiar to the new-born—e.g., gastro-enteritis. By far the commonest cause was an antenatal infection—e.g., syphilis. Pneumonia was found in 24 out of the 73 cases. It was probable that the infection might occur and the disease commence before birth. Even in those cases in which the disease was found to be advanced at autopsy, the true condition had not been suspected during life and no characteristic symptom noted which might have led to a physical examination. When a young infant was cyanosed, with cold skin and extremities, fed badly, and was fretful, pneumonia should be suspected. Dr. Browne went on to describe some cases of intranatal pneumonia and discussed the path of infection, and he suggested that when a fœtus was being asphxiated its respiratory centre was stimulated by the accumulating CO_2 in its blood and thereby the fœtus inspired, drawing infective mucus or liquor into the trachea or bronchi. The author then briefly referred to toxæmic causes and prematurity. Regarding the prevention of stillbirth, Dr. Browne said that it was surely unnecessary to emphasise the need for adequate antenatal supervision during pregnancy, but there were one or two points to which he would like to draw particular attention. He thought that a strong case could be made out for the routine induction of labour in primigravidæ about ten days before term. This guarded against the production of asphyxia and an easier and less prolonged labour was thereby ensured. Secondly, he would emphasise the danger of breech deliveries and urge the necessity for prophylactic external version at the beginning of the ninth month. Much could be done to shorten labour by external rotation of posterior cases by means of pads, and special wards set apart for infants would do much to guard them from such infections as pneumonia.

Prof. B. P. WATSON said that he admired the way in which Dr. Browne had tackled this subject.

Dr. WILLIAM FORDYCE doubted the wisdom of inducing labour ten days before full time, and Dr. HAIG FERGUSON also joined in the discussion.

Dr. BROWNE briefly replied.

Exhibition of Cases and Specimens.

Dr. HAIG FERGUSON described in detail a strange case of a pendulous tumour of the labium majus exhibiting unusual features. The case had been taken for a hernia into the labium, but laparotomy proved that it had no connexion with the peritoneal cavity, and he had dissected out the growth. Dr. Ferguson could find no record of an exactly similar case in the literature, and a pathologist had expressed the opinion that the growth was a telangiectatic fibromyoma with hyaline degeneration.

A number of specimens were then shown. Dr. FORDYCE described an unusual fibroid tumour.—Dr. FERGUSON showed a uterus with squamoid metaplasia of the gland epithelium with early malignancy, and in the same patient an ovary showing early sarcoma.—The PRESIDENT described three specimens: (*a*) an ovary with chocolate cysts; (*b*) large ovarian tumour removed from a patient six months pregnant; (*c*) uterus removed by vaginal hysterectomy from a case of complete prolapse showing great elongation of the supravaginal cervix.

Reviews and Notices of Books.

HUMAN PROTOZOOLOGY.

By ROBERT W. HEGNER, Ph.D., and WILLIAM H. TALIAFERRO, Ph.D. New York: The Macmillan Company. 1924. Pp. 597. 21*s*.

As an introduction to the subject of medical protozoology this book satisfies a need. The information, which has been gathered from authoritative sources and the authors' own experiences, is presented in a clear and intelligible form. There are two coloured plates of malarial parasites and numerous illustrations in black and white, many of them original. The book assumes no previous knowledge of the subject, and will prove of great assistance to those who approach this branch of medical science for the first time. It represents essentially the subject-matter of the course in protozoology given by the writers in the School of Hygiene and Public Health of the Johns Hopkins University, and will be of considerable assistance to those who are taking out courses in tropical medicine at one or other of the recognised schools.

After a few introductory remarks on the organisation and method of reproduction of protozoa in general, the four classes—Sarcodina, Mastigophora, Sporozoa, and Infusoria—are considered in detail. In the description of each class a section devoted to general considerations, including the morphological characteristics, classification, and physiology of the class, with reference to free-living as well as parasitic forms, is followed by a detailed account of the parasites of man, with some reference to the allied species which occur in animals. The book concludes with two chapters in which the genetics and physiology of reproduction and the diagnosis of the intestinal protozoa are discussed. In the section dealing with the amœbæ parasitic in man the well-known species are carefully described; the generic title *Entamœba* is spelt *Endamœba*, a procedure which though usual in America is not generally adopted in other countries.

In considering the cultivation of the *Entamœba histolytica* Cutler's work is mentioned, and reference is made to Barret and Smith's successful cultivation of an *entamœba* of the turtle. The parasitic Mastigophora are dealt with in two chapters entitled Hæmoflagellates and Intestinal Flagellates. In the former are considered the trypanosomes and leishmania which infect man, as well as some of the forms which occur in animals. It would have been advantageous if room could have been found for a more detailed and illustrated description of *Trypanosoma vivax*, *Trypanosoma congolense*, and *Trypanosoma evansi*, especially as considerable space has been devoted to *Trypanosoma lewisi* of the rat. The intestinal flagellates of man are carefully described. It is assumed that the flagellate described as *Tricercomonas intestinalis* by Wenyon and O'Connor is the same as one previously named *Enteromonas hominis* by Fonseca; this is by no means clear, however, as the descriptions of the two organisms vary considerably. The Sporozoa receive due attention; the hæmogregarines are grouped in a single genus *Hæmogregarina* under the Hæmosporidia, a procedure not in accord with recent investigations. In the chapter devoted to the genetics and physiology of reproduction the various phenomena, such as binary fission, conjugation and its physiological effects on the race, endomixis, and asexual and sexual reproduction in its relation to inheritance and race production are explained with special reference to parasitic forms. The chapter on the diagnosis of intestinal protozoa presents valuable information. The method of making preparations of fæces for diagnostic purposes, concentration methods for encysted forms, the vegetable organisms which may cause confusion, and the large group of coprozoic organisms which often lead students astray, all receive consideration. Finally there is included a comprehensive bibliography as well as a good index of authors and subjects.

This useful volume can be thoroughly recommended.

EAR, NOSE, AND THROAT.

Diseases of the Nose, Throat, and Ear. For Practitioners and Students. Edited by A. LOGAN TURNER, M.D., F.R.C.S.Edin., Surgeon-Consultant, Ear and Throat Department, Royal Infirmary, Edinburgh. Bristol: John Wright and Sons. 1924. Pp. 413. 20*s*.

IN 1912 Dr. W. G. Porter published a very useful manual of moderate size on diseases of the throat, nose, and ear for practitioners and students; this proved highly successful, and a second edition was brought out in 1916 edited by Dr. P. McBride for the author, who was at that time absent on war service. Dr. Porter was killed in action in France in 1917, and a third edition was published in 1919, under the editorship of Dr. A. Logan Turner, by his former colleagues in Edinburgh, as a tribute to his memory. This has now been expanded under the same editorship into the present volume. It is planned on lines similar to those of Dr. Porter's original book, and has been expanded by about 50 per cent.; being written for practitioners and students, full details of the larger operations are not given, but only sufficient to provide a clear idea of their method and scope; while the indications for such operations are fully discussed, the details of after-treatment, which often falls to the practitioner, might in places be more fully described. Dr. A. Logan Turner and Mr. W. T. Gardiner are responsible for the section on diseases of the nose, Dr. Logan Turner for that on the paranasal sinuses; Mr. Douglas Guthrie has undertaken the pharynx and nasopharynx, Mr. J. D. Lithgow the larynx, Mr. G. Ewart Martin peroral endoscopy, and Mr. J. S. Fraser the ear. The illustrations are many and good; the book is well balanced and clearly written, and may confidently be recommended for the use of students and practitioners.

Chirurgie de l'Oreille, du Nez, du Pharynx, et du Larynx. Second edition. By GEORGES LAURENS. Paris: Masson et Cie. 1924. Pp. 1052. Fr. 100.

WE congratulate Dr. Georges Laurens on the production of this standard work on the subject. The steps of operations are well described, alternative methods being given; the indications and contra-indications for particular operations are discussed, and after-treatment and results of operation are considered. The illustrations are numerous and show clearly the stage of operation under consideration. Besides the more common operations, those less often practised receive full consideration; thus removal of tumours of the cerebello-pontine angle is described, together with a brief account of their symptoms; and such subjects as stenosis of the larynx and trachea, and difficulty of decannulisation after tracheotomy, receive adequate attention, while endoscopy is well described and illustrated. In most subjects the practice is very similar to that of this country, the most marked difference being the much greater use of local and far less frequent employment of general anæsthesia; each operation is preceded by a complete and illustrated description of the technique of local anæsthetisation, which will be most useful to surgeons here who are less familiar with the method. Of laryngectomy the author says, "Two points are to be remembered: the superiority of local and the dangers of general anæsthesia"; although the technique of the former is difficult and elaborate, we might perhaps employ it with advantage more frequently in this country for major operations on the larynx and trachea, as we now do for such smaller operations as tracheotomy. But we disagree entirely with the recommendation for removal of tonsils in children, to operate without

anæsthesia, or to give ethyl chloride with the child in the sitting posture; the nervous shock caused by these operations without anæsthesia far more than offsets the slight danger of a skilfully given general anæsthetic, and ether is preferable to ethyl chloride as it gives time for a deliberate operation and the control of hæmorrhage. Indeed, we cannot but consider that, in the whole matter of tonsil operations the practice in France, as shown in this and other recent publications, is behind that of Great Britain and America. Dr. Laurens prefers tonsillotomy, and the method of *morcellement*, to complete removal, although he admits that, "on assisting at a well-performed tonsillectomy, one is sometimes surprised to see a buried tonsil, quite small in appearance, show at the end of the forceps as a fungating tumour of a size which one would never have suspected and infiltrated with infected caseating foci." Of the guillotine he states that "it is no longer employed, and is an instrument relegated to the museum-case, though perhaps it does not deserve this, for it cuts the pedunculated tonsils of small children quite well"; of the blunt "reversed guillotine" methods associated with the names of Whillis and Sluder, which are extensively and successfully employed here to remove the tonsil completely in its capsule, he only says that "Sluder has modified the old tonsillotomy, but his method is not applicable to all cases."

Dr. Laurens's book covers the entire field of surgery of the ear, nose, and throat, and is well worth study.

Ear, Nose, and Throat Treatment in General Practice. By GEORGES PORTMANN, M.D., Professor Agrégé of Oto-Rhino-Laryngology, Faculty of Medicine of Bordeaux. Translated and edited by R. SCOTT STEVENSON, M.D., Assistant Surgeon, Metropolitan Ear and Throat Hospital. London: William Heinemann. 1924. Pp. 180. 10*s.* 6*d.*

THIS little book deals almost entirely with the drug treatment of diseases of the ear, nose, and throat, and has been made more available to practitioners in this country by the translation of the prescriptions into English weights and measures. The translator has made certain modifications where the accepted British and French opinions on a subject are quite incompatible, and it would, perhaps, have been well to indicate in the text where this has been done; he also draws attention to Dr. Portmann's free use of cocaine, especially in acute conditions, as contrary to British practice. The book is arranged as a list of diseases, each disease being headed by a title and a short description followed by an account of the local treatment advised, and, finally by general treatment. The latter is in general very condensed; little or no indication is given of the rarity of the affection under discussion, nor of its severity, and we are seldom told whether the patient should be kept in bed or allowed to continue his work. It is sometimes difficult to recognise the variety of disease concerned by the title and description in the heading. Under local treatment a large number of prescriptions are given for gargles, "throat baths," paints, and sprays, many of these being frequently repeated with slight variations under different headings; this section is the most valuable feature of the book, and should be useful both to the consultant and general practitioner.

UROLOGY.

Archives Urologiques de la Clinique de Necker. Published by F. LEGUEU, Professeur de Clinique des Maladies des Voies Urinaires, Chirurgien de l'Hôpital Necker. Vol. IV., Part 1. Paris: A. Maloine et Fils. 1923. Pp. 97.

THIS is a collection of papers by various authors who have worked in Prof. Legueu's clinic. Vaccine treatment of abscess of the prostate is dealt with by P. Fouquiau, who concludes that the disease is rendered less serious and its course shortened by the exhibition of a staphylococcal vaccine. Prof. J. G. Cano describes a new intravenous treatment of gonorrhœa by means of a mixture of methylene-blue and phenol dissolved in an animal serum rich in albumin and globulins. The results show a more rapid cure and a freedom from complications, especially from chronic gleet. Anghel calls attention to ulcerative lesions which are provoked by an indwelling catheter at the penoscrotal angle and gives advice as to how such lesions may be prevented. H. Béclère and B. Fey give an interesting discussion on the differential diagnosis by radiography between stone in the kidney and biliary calculus. Other contributions are: Infection of the Adenomatous Prostate (Astraldi), Peri-Urethral Abscess (Manthopoulo), and Traumatic Rupture of a Varicocele (Astraldi).

SURGICAL HANDICRAFT.

A Manual of Surgical Handicraft and Physiotherapy. Vol. I. By J. RENFREW WHITE, M.S., F.R.C.S., Assistant Surgeon, Dunedin Hospital; Assistant Lecturer in Clinical Surgery, University of Otago. Dunedin: Coulls, Somerville, Wilkie, Ltd. 1923. Pp. 566–xxi.

THE author states in his preface that he has written his book for junior medical students, but certainly it should be read by residents and practitioners. It resembles in its general arrangement and in subject-matter the usual house surgeons' manual of surgical handicraft, but has special features of its own which render it particularly useful. For example, full instructions are given in the mechanism and use of the autoclave, the administration of enemata, the application of radiant heat, the transport of patients, and the conduct of operations. Special formulæ, which are sometimes difficult to find, are easily discovered by reference to the index and a commendable feature is the author's practice of describing the use of special methods—Beck's paste method, for instance—in the originators' own words. It is probable that in the next edition the author will be able to eliminate a certain number of methods and formulæ which are now falling into disuse.

ORGANIC SUBSTANCES, SERA AND VACCINES IN PHYSIOLOGICAL THERAPEUTICS.

By D. W. CARMALT-JONES, M.D. Oxon., F.R.C.P. Lond., Professor of Systematic Medicine, University of Otago, New Zealand. London: William Heinemann. 1924. Pp. 395. 15*s.*

IN selecting his title Prof. Carmalt-Jones appears to have ignored the fact that drugs of vegetable origin are as much "organic substances" as those derived from the animal kingdom. It is to the latter alone, and in particular to those manufactured from organs known or alleged to have a content of "hormone," to which the first section of the book is devoted. The most vivid resemblance at present discernible between these particular "organic substances" and the equally organic sera and vaccines dealt with in the remaining sections lies in the vast amount of theorising to which they all have given rise, and the frequently doubtful results of their exhibition. A further point in common to "organo-" and vaccine-therapy is that both in the minds of many practitioners are invested with a certain measure of mystery. It is for the practising medical man that Prof. Carmalt-Jones has written, and this last consideration may have weighed with him in bringing his expositions of the two varieties of therapeusis together in one volume.

To the practising physician the author's clear and detailed indications for the exhibition and dosage of the substances with which he deals should prove of very real value, though descriptions of the technique of such procedures as the complement-fixation test and the determination of the opsonic index may be of little interest to the bulk of practitioners, while as given by Prof. Carmalt-Jones they are not detailed enough for the guidance of the laboratory worker. Failure to provide the minutiæ of details

of technique cannot, however, be imputed to the author as a general fault; pp. 132 to 138 are devoted entirely to a description of the method of taking blood from a vein for culture, at the conclusion of which the reader is left with a syringe full of blood and no instructions as to what to do with it before it clots. The section on serum-therapy would have been rendered more valuable by a consideration at greater length of anaphylaxis, and by the inclusion of details of the methods for testing for sensitiveness and of abolishing it when discovered. In this connexion it is noteworthy that although the terms "apo-" and "epi-phylaxis" with which Sir Almroth Wright has enriched the language both find places in the index, the more generally recognised "anaphylaxis" fails to do so.

We mention these poin's that they may be rectified in subsequent issues.

BRITISH GUIANA MEDICAL ANNUAL, 1923.

Edited by F. G. ROSE, M.B., B.C. Cantab. Demerara: Daily Chronicle, Ltd., Georgetown. Pp. 181. 7s.

THIS is a selection of papers presented at the West Indian Medical Conference—most of which reach a high standard of accomplishment. But it is stated that in all probability this issue will be the last, as it is hoped to establish a combined West Indian medical journal. The editor contributes a useful study of the biological characters of the effluents from septic tanks in British Guiana, as well as a paper on the leucocytes in filariasis and the use of vaccines in that disease. There are two papers on alastrim, by Dr. J. R. Dickson and Dr. C. S. Gideon, the general opinion seeming to favour its differentiation from true small-pox, a view not usually held. Dr. Wolff, Government bacteriologist of Dutch Guiana, writes on dermal leishmaniasis in Surinam; Dr. J. Anderson on dysentery, its diagnosis and treatment; and Dr. C. U. Lee submits a report upon the incidence of filarial infection amongst the Chinese and immigrant races in Georgetown. Dr. W. de W. Wishart contributes two papers on public health problems in Georgetown, one dealing with infant welfare. The Editor and Dr. J. E. Chow have written a résumé of scientific work published by medical men in British Guiana from 1769 up to the present day. Various of the short clinical papers now incorporated in this Annual were printed in the Transactions of the British Guiana branch of the B.M.A.

CANCER.

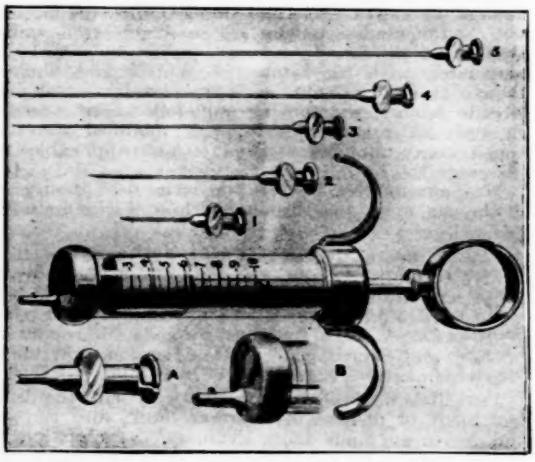
How it is Caused. How it Can be Prevented. By J. ELLIS BARKER. With an introduction by Sir W. ARBUTHNOT LANE, Bart. London: John Murray. 1924. Pp. 432. 7s. 6d.

THE message of Mr. Ellis Barker is that civilised mankind suffers from constipation, chronic poisoning by the chemicals used as food preservatives, and vitamin starvation, and that this is responsible for much ill-health. This is not new, though the author does his best to make it look new by employing in his writings the polemical methods which are effective in dealing with political and economic matters—subjects which have occupied his attention in the past. He then proceeds to argue that cancer being, as he says, a disease of civilisation, is due to dietetic errors inducing chronic poisoning and vitamin starvation. In supporting his view he produces statistical fallacies which have done duty often for this kind of argument. Mr. Ellis Barker is very ill-informed on the subject on which he writes—apparently as a self-constituted authority. If we accepted his statistical fallacies we could use his arguments to prove that cancer is due to an excess of vitamins. For has not in Japan the incidence of cancer increased greatly, while at the same time that of beri-beri has diminished?

New Inventions.

A SYRINGE FOR REGIONAL ANÆSTHESIA INCLUDING SPLANCHNIC ANALGESIA.

THE syringe illustrated has been designed for regional anæsthetic work, including splanchnic analgesia, for which a specially long needle is required. The syringe is of the Record type and is capable of holding 12 c.cm., but is graduated to 10 c.cm. only, the remaining 2 c.cm. being available for aspiration after the syringe has been filled to the 10 c.cm. mark and has been attached to the needle already in position in the patient. The barrel is made of glass so that on aspiration it is possible to see whether blood has entered the syringe, a most vital point in regional anæsthetic work, otherwise the contents of the syringe might be discharged into a blood-vessel.



Syringe for regional anæsthesia. A shows the bayonet fitting enlarged; B, the peripheral nozzle and pin.

The barrel is closed by means of a screw-fitting cap bearing half-rings on either side so that an easy grip is obtained while injecting. The ordinary record fitting is apt to slip and therefore the screw cap was substituted to overcome this disadvantage.

The syringe is made with a peripheral nozzle which greatly facilitates its use in some positions and is especially useful for raising the cuticular wheal with the fine needle before introducing the larger-sized needles through the skin. The nozzle is made with a pin which holds the bayonet fitting with which each needle is made, thus preventing any "flying off" of the needle when injecting. Fig. A shows the bayonet fitting enlarged and Fig. B the peripheral nozzle and pin. The needles are made of rustless steel and are of the sizes recommended in Labat's "Regional Anæsthesia," the No. 5 needle being used for inducing splanchnic analgesia and the No. 1 for raising the cuticular wheal. The sizes are as follows:—

	Length in mm.	Diameter in mm.
Needle No. 1	20	0·6
,, ,, 2	50	0·7
,, ,, 3	80	0·8
,, ,, 4	100	0·9
,, ,, 5	120	1·0

The syringe has been made for me by Messrs. Arnold and Sons (John Bell and Croyden Limited), 50–52, Wigmore-street, W. 1, and they supply it in a box containing three of each size of needle.

O. STANLEY HILLMAN, F.R.C.S. Eng.
Middlesex Hospital, London, W.

THE LANCET.

LONDON: SATURDAY, JULY 12, 1924.

THE NATIONAL PHYSICAL LABORATORY.

AT the invitation of the President of the Royal Society, a large company gathered at the National Physical Laboratory on June 24th to visit the research and testing departments. The inspection, an annual event, is greatly appreciated by scientists, for it affords an opportunity of gaining first-hand information about current physical problems from experts who are bent on solving them. The efficiency in routine measurement and activity in research observable in all departments of this laboratory is a valuable lesson in scientific method and industry. In the thermometry section, for example, approximately 15,000 clinical thermometers are tested weekly. Soda-glass instruments show a tendency to fail as maximum thermometers, and this deficiency has made it desirable to detect these instruments quickly. For this purpose an X ray set has been installed. When a trayful of thermometers is passed between the X ray bulb and a fluorescent screen, the greater transparency to X rays of soda-glass instruments renders them easily distinguishable from those made of glass approved by the laboratory.

One of the new features in the radiology department is the testing of materials used in radiotherapy. For measurements of the lead equivalents of protective materials either a balance or a substitution ionisation method is used, the former for protectives equivalent to 0·1 mm. lead and the latter for thicker materials. Stress is laid upon the importance of testing lead-free protective materials at more than one exciting voltage on the X ray tube. Radiographs of commercial ebonite often indicate metallic dust distributed through the material, which renders it valueless for insulating purposes. Facilities have, therefore, been provided for the radiographic examination of materials used in the construction of apparatus. The importance of a preliminary radiographic examination of insulating materials, which would prevent the frequent occurrence of insulation trouble in high tension apparatus, can hardly be over-estimated. We note with satisfaction that the department is now prepared to test all kinds of X ray and electro-medical apparatus. Performance tests on high tension transformers, coils, couches, screening and tube stands are becoming a routine practice, and endurance and efficiency tests are also undertaken. The efficiency of apparatus in current use would appear of secondary importance; for this is seldom known, so that it is common to find apparatus being run far below its maximum efficiency with consequent waste of time and energy. The radiology department will doubtless make a feature of efficiency tests, the results of which may well lead to material improvement in the design and standardisation of X ray and electro-medical apparatus. The fees for the above tests are high, but as the supply of instruments for testing increases, they will be reduced. Considerable experimental work on the methods of obtaining high vacuums has been done at the laboratory, resulting in important technical improvements in existing methods. Annular mercury jet pumps have been constructed in metal which have decided advantages over the usual glass diffusion pumps; these are considerably more efficient, being capable of exhausting at the rate of 7 litres per second, so that a high degree of vacuum can be obtained in a well-prepared X ray tube in a few seconds.

During the past year the department of sound has been extended considerably, and a variety of problems are now receiving experimental treatment. The acoustic features of rooms are being studied by a ripple tank method. A wooden model, based on section drawings of a hall, is laid flat upon the bottom of the tank. The propagation of waves through a room, caused by a mechanical dipper which disturbs the water within the model, may be observed directly or photographed. By this means it is possible to determine what structural alterations to the hall are necessary to remove its acoustic defects. Researches on the photography of sound are also proceeding and some interesting results have been obtained. By the ingenious method of placing two point sparks gaps of different metals in series, the light from one renders visible for a short time the sound disturbance from the other. Experiments on the transmission and reflection of sound by partitions are being conducted in padded rooms. The method adopted is to reflect sound from a loud speaker to the partition under test by means of a parabolic reflector. The properties of the sound issuing in various directions from the partition are then tested by electrical means. Another interesting example of research in applied science is the investigation of the problems of refrigeration which has been begun at the laboratory during the past year. Models of ships holds are made and the temperature distribution in them is measured by a system of thermo-couples. Smoke is used to watch the circulation of air in the hold, which should be efficient to remove the large quantities of carbon dioxide evolved from fruit and to establish a uniform temperature. The question of a packing material suitable for perishable goods is also under consideration, and experimental data are being collected to determine the most suitable substances for this purpose. In this problem the thermal conductivity of the material is an important factor and has been determined for a variety of substances such as expanded rubber and compressed cork.

The advance in research and technique which has been made at the laboratory during the past year has been remarkable, and forms a valuable contribution to our national scientific equipment.

TOWN PLANNING LEGISLATION.

THE two Town Planning Bills (for England and Scotland respectively) have now emerged from Joint Select Committee in amended form, and it may be hoped that they will have an opportunity of becoming law this session. Each of the Bills consolidates the existing legislation (beginning with the Act of 1909) into a convenient document containing 22 sections and four schedules. It would not have been difficult to make one Bill serve for both England and Scotland, a clause being added to comprise such adaptations as are necessary in view of the different central and local authorities in Scotland and in view of the unassimilated details of Scottish administration. Scottish feeling, however, is naturally in favour of having a separate Bill for Scotland, and Scottish influence in Parliament, never negligible, is strong to-day. If these two measures can be passed, we hope that the excellent consolidating Bill which the Ministry of Health has prepared for dealing comprehensively with the law of National Health Insurance will also be given a

chance of gaining the Royal Assent before the summer holidays, and that the other consolidations dealing with housing and public health will be pressed forward.

The science of town planning has somehow not yet come into its own. The Review of Legislation in 1922, recently published by the Society of Comparative Legislation, shows no great development of town planning in the legislation of the British Dominions overseas. The State of Victoria set up in 1922 a Metropolitan Town Planning Commission with a duration limited to three years and an expenditure limited to £7500. The Commission is directed to inquire into and report upon the conditions and tendencies of urban development and to make recommendations for its future guidance in consultation with the municipalities and public authorities concerned. Its scope is wide, as it is to examine not only roads, traffic and transportation, and water-front and river improvement, but also food supplies and general amenities. The State of Western Australia legislated about rights in light and air. More than 20 years ago Western Australia revolted from the English Common Law and boldly abolished the acquisition of easements of light and air by prescription; grants of such easements were to be restricted to periods of 21 years. In 1922 the restriction was altered. Grants for longer periods were made possible with the written approval of the governor, but no grant is to prevent the erection of a building on the alignment of a street to a depth of 12 feet. After all, even if there is often something irritating about the system of asserting prescriptive rights, light and air are worth preserving. There is, fortunately, less heard at the moment of the architectural experts who want to abolish the London Building Acts and fill the city and metropolis with sky-scrapers. London has afforded few chances of town planning since Wren produced his scheme for rebuilding the area devastated by the Great Fire. If Great Britain is already too congested to give the town-planning expert the opportunities which await him in more spacious countries, the dwellers in our cities must be content with minor mercies. The Public Health (Smoke Abatement) Bill, now being introduced in the House of Lords by the Earl DE LA WARR, may do something to enhance municipal amenities.

RECENT DEVELOPMENTS IN TISSUE CULTURE.

IT is a remarkable thing that although the possibilities of tissue culture were demonstrated more than 20 years ago, the technique has hardly emerged from the experimental stage. We do not yet know whether we have in the method a means of solving certain fundamental biological questions which other lines of investigation have failed to answer, or merely a barren though brilliant laboratory technique. Many workers, of course, have successfully cultivated tissues outside the body, and it would seem that with proper precautions such cultures may be propagated practically for ever. The histological structure of the culture may be modified by various means, and its rate of growth accelerated or diminished; but beyond these somewhat primitive observations it is disappointing to record that very little has emerged. The technique is undoubtedly tedious and difficult; but all was not plain sailing for the early bacteriologists, and one cannot help feeling that in their attitude towards "in vitro" culture biologists have exhibited something of that "lag" which is so familiar in the cultures themselves. Fortunately there are indications that this period of neglect is at an end. The conviction is steadily growing that tissue culture is a really valuable experimental method, one which should be a commonplace in every pathological or biological institute, rather than a field of endeavour for the more adventurous pioneers.

Mr. T. S. P. STRANGEWAYS has placed laboratory workers under a debt of gratitude, for in two recent publications[1] he has, as it were, lifted the veil of mystery and placed the technique of tissue culture on a sound practical footing. In these little books he describes the method of carrying out tissue culture and some of the results he has obtained. In the book on technique he discusses, with admirable clearness and with the utmost attention to detail, every step in the manipulation necessary to procure satisfactory cultures. No point is too small to escape his notice; in fact, at times he seems to border on the meticulous. But it may be supposed that he does not write thus without very good reasons. In his preface he says: "The beginner will doubtless be tempted to modify the technique recommended in this work, especially if after a few trials he fails to obtain satisfactory results. The writer would, however, urge him to wait until he has succeeded in cultivating tissues by the methods described before he attempts any original improvements." And it is not difficult to read between the lines. Any variations in technique, if they are to be of value, must be the outcome of an accurate and practical knowledge of the methods now in vogue. Such knowledge is obviously possessed by Dr. THOMAS LUMSDEN, who in this issue of THE LANCET draws attention to what appears to be an extremely satisfactory method of growing tissues in vitro. Instead of using plasma or an artificial synthetic solution as his culture medium he employs serum, with excellent results. He has been successful where others have failed because he has recognised that the pH of the medium is of the utmost importance, and that serum rapidly becomes impossibly alkaline on exposure to the air by the loss of CO_2. By avoiding such exposure, the pH of serum remains below the necessary limit of 7·7, and tissues will grow in it with great readiness. The importance of Dr. LUMSDEN'S work is undoubted, for it has long been obvious that a profound simplification of the technique would be a necessary preliminary to the general adoption of tissue culture as a routine method of investigation rather than as an end in itself. No laboratory procedure which requires a minimum apprenticeship of four months can ever become popular, nor on the face of it would such a prolonged training seem necessary. After all, the basis of the method has been firmly established in the last few years. All authorities insist upon the necessity for the most rigid asepsis, but this should not be so difficult to achieve. Our modern medical curriculum must be gravely at fault if, at the end of it, the theory and practice of asepsis are not so deeply ingrained in the student as to become a second nature to him. Ordinary technical skill, combined with a sound laboratory training, should fit anyone to undertake tissue culture work; and though success may come to some investigators more easily than to others, we cannot believe that it is not within the reach of all.

In the second of his recent publications Mr. STRANGEWAYS deals with some of the more important observations he has made on the growth and behaviour of the normal cell, and the cell modified by various agencies, in cultures outside the body; and he tells us

[1] The Technique of Tissue Culture "In Vitro." Cambridge: Heffer. 1924. Pp. 80. 7*s*. 6*d*. Tissue Culture in Relation to Growth and Differentiation. Same publishers. 1924. Pp. 50. 5*s*.

enough to make it obvious that in this direction alone the method has far-reaching possibilities. He brings forward evidence to show, for example, that mitotic division is not so much the expression of the necessity for cell multiplication as a means by which the cell may adjust itself to altered conditions of environment, and he suggests a valuable field of research for the experimental cytologist. An even more important application of the technique will probably be evolved in the direction of the study of the medium. In other words, cytological studies will not be the only end of "in vitro" cultures, but the growing tissue may serve as a reliable and convenient indicator of the properties of the medium. This implies, of course, a regular and high proportion of successful cultures, and also the possibility of growing tissues in a greater bulk of fluid—in a test-tube, for example. But whatever the future of the method may be, the tissue culture should now pass out of the stage of being a laboratory curiosity and achieve the importance of an experimental technique.

RATIONS FOR THE INSANE.

THE report of the committee on dietaries in mental hospitals, which is abstracted on p. 81, shows that careful and exhaustive inquiry has enabled definite constructive recommendations to be made. The trouble taken by the committee to obtain relevant information on the practical as well as the theoretical aspect of the subject before coming to any conclusion enhances considerably the value of their proposals. As a preliminary measure the committee asked for and obtained copies of the dietary scales then in force in all county and borough mental hospitals. These were carefully examined, amended by correspondence where necessary, and expressed in terms of calorie values; the final results were submitted to the Quantitative Nutritional Committee of the Medical Research Council for an expression of opinion on their prima facie interpretation. A statement was also obtained from medical superintendents of mental hospitals as to the cost of all such dietaries. Taking as the basis for consideration the accepted food requirements for normal adults, the committee then proceeded, by obtaining anthropometric measurements and other data, to ascertain how far these quantities were applicable to a population of persons suffering from mental disorder; subsequently checking the conclusions by special experiments in basal metabolism, made at the Middlesex County (Springfield) Mental Hospital. Such oral evidence on definite points, as seemed necessary, was then obtained from various sources as—the medical superintendents of some mental hospitals; clerks and stewards deputed for this purpose by the Association of Clerks and Stewards of Mental Hospitals; from the persons in control of kitchens in general hospitals; from the managers, engineers, and cooks of large catering concerns, and from firms supplying kitchen equipment. Visits were paid by the committee, or by some of its members, to a number of mental hospitals, to the kitchens, stores, and cold storages of certain general hospitals, and to modern catering establishments. The chief reasons for these visits were to inquire into the value of certain varying methods in force in different institutions, and to acquire knowledge generally regarding kitchen equipment, the preservation of food, its preparation for table in large quantities, and the means adopted for its distribution whilst hot to considerable numbers of persons. A member of a well-known firm of domestic engineers, who is thoroughly conversant with the apparatus now employed in the preparation, cooking, and distribution of food in mental hospitals in England and Wales, was, moreover, instructed to inquire into arrangements for food preparation and distribution in current use in America and Canada in these hospitals. A model dietary which seemed to meet requirements and be free from the defects in existing scales was then prepared and circulated to the medical superintendents of all mental hospitals with a request for suggestions and estimates of the cost of adopting the model dietary. Detailed replies were received from all of the 95 superintendents to whom the circular was addressed, and were surprisingly divergent. A more exact estimate, founded strictly upon contract prices in force on March 20th, 1924, was obtained from the authorities of a mental hospital in the London district, where more than 1400 persons are fed entirely on food purchased from outside, no home produce being used. The conclusion as to the maximum cost of the diet (8¼*d.* and 8¾*d.* per head per day respectively for country and borough mental hospitals) is thus founded on sound premisses. We congratulate the committee on having succeeded in their object of suggesting a dietary that shall be sufficiently adequate for the maintenance of health and vitality and at the same time be a practical proposition.

Annotations.

"Ne quid nimis."

NATIONAL HEALTH INSURANCE: APPOINTMENT OF A ROYAL COMMISSION.

THE appointment of a Royal Commission on National Health Insurance was announced on Monday last with the following terms of reference: To inquire into the scheme of National Health Insurance established by the National Health Insurance Acts, 1911–1922, and to report what, if any, alterations, extensions, or developments should be made in regard to the scope of that scheme and the administrative, financial, and medical arrangements set up under it. The constitution of this Commission is as follows: Lord Lawrence of Kingsgate (chairman), Sir John Anderson, Sir Humphry Rolleston, Bart., Sir Alfred Watson, Sir Arthur Worley, Sir Andrew Duncan, Mr. A. D. Besant, F.I.A., Mr. F. Bramley, Prof. Alexander Gray, Miss Gertrude Tuckwell, Mrs. Harrison Bell, Mr. James Cook, Mr. John Evans, and Mr. William Jones. The secretary of the Commission, to whom all communications should be addressed, is Mr. E. Hackforth, of the Ministry of Health, Whitehall, S.W. 1, and the assistant secretary is Mr. J. W. Peck, C.B., of the Scottish Board of Health. The Commission is fairly representative of the interests concerned, but the President of the Royal College of Physicians of London is the solitary representative of medicine. Mr. Digby Besant has an actuarial experience of medical affairs which make his presence on a Commission very apt.

DISTEMPER.

AN interim report of the activities of the Council for the Study of Dog Distemper was recently issued to the press by Sir Theodore Cook, the hon. secretary. It would appear from the report that the long preparation for the study of distemper is now completed. Buildings for the breeding and rearing of puppies, a hospital for the treatment of dogs suffering from distemper, and a new and properly equipped laboratory have been erected. The last half-yearly report of the Distemper Council intimated that the arrangements for producing "clean" puppies for experimental work were in the hands of Major G. W. Dunkin, M.R.C.V.S., and Prof. J. B. Buxton, F.R.C.V.S. It is now announced that the new laboratories are in the charge of Dr. W. E. Gye, who will be responsible for the experimental work. The enterprise will be watched with the greatest interest by the medical profession. Dog distemper is such a highly contagious disease that only by the most elaborate precautions and by the exercise of the utmost care can the spread of infection be prevented. Previous workers have sometimes had their investigations ruined by accidental or "spontaneous" cases of distemper occurring in control animals; they have all been hampered by the difficulty of obtaining

an adequate supply of healthy puppies which had not suffered from distemper and had never been exposed to the risk of infection. It is indeed probable that the first generation of puppies, reared under conditions which exclude the possibility of distemper infection occurring, will not prove entirely satisfactory. An inheritance of partial immunity may well complicate the experimental study. The second and later generations become progressively more susceptible to the disease and consequently are more suitable for the work in hand, but it will take a long time to obtain such puppies. Patience is thus demanded even for the provision of material for study—the routine part of the work. The real difficulties will begin with the attempts to isolate the causal organism. It is commonly believed that the organism belongs to the group of "filter-passers," but this is by no means certain, as recent work in Japan [1] has shown. The first step in the research must be to show conclusively whether the distemper virus is filterable or not. The tedious, but necessary, preliminaries to this task appear to have been overcome; the laboratories and kennels are well equipped, through the generosity of the subscribers to the Field Distemper Fund, and the work is being carried out under the best possible auspices with good chances of success. May good fortune attend it.

SOCIETY FOR THE PREVENTION OF VENEREAL DISEASE.

THE fifth annual general meeting of the Society was held on July 10th, Sir Auckland Geddes presiding, in succession to the late Lord Willoughby de Broke. In an interesting address outlining forcibly the necessity for a regulated frankness especially at the educational period with reference to venereal disease, Sir Auckland Geddes indicated the value that might accrue from the union of the Society with the National Council for the Control of Venereal Diseases in one strong body, but he said that the value of such a union would be damaged if the result were "to diminish the weight of the attack on the causal organisms of venereal diseases." He then moved a resolution embodying a request to the Ministry of Health for the allocation to the Society of a fair share of any money set aside for the education of the public regarding venereal diseases and their prevention. Mr. Wansey Bayly then laid before the meeting details of the work of the Society during the past year when other members of the executive present spoke from various points of view as to the work of the Society and the need for its official recognition.

TEMPERATURE REGULATION AFTER SPINAL TRANSECTION.

A CONTRIBUTION by Prof. C. S. Sherrington, P.R.S., to the current number of the *Journal of Physiology*, modestly entitled Notes on Temperature after Spinal Transection, with Some Observations on Shivering, contains amongst other matters important observations on impairment of temperature regulation in paraplegic dogs which for other reasons were kept for relatively long periods. Severance of the spinal cord was in every case performed under deep anæsthesia and with full precautions against sepsis. In some animals the spinal transection was situated as far forward as the cervical region. The impairment of thermotaxis remains severe long after complete subsidence of the acute symptoms of "spinal" shock. A normal dog, lightly anæsthetised and immersed up to its middle in ice-cold water for 10 minutes, showed a fall of mouth temperature from 37·6° to 37·2° C. A small dog similarly immersed 530 days after spinal transection (first thoracic level) showed a fall of mouth temperature from 37·9° to 33·9° C. Immersion under the same conditions of an unanæsthetised normal dog of 4 kilos weight brought the mouth temperature from 37·9° down to 37·2° C. in 18 minutes, while a repetition of the procedure on this same dog 30 days after spinal transection at the sixth thoracic segment brought the mouth temperature from 37·5° down to 35·8° C. in 18 minutes. It is known that the degree of impairment of thermotaxis in paraplegia is proportioned to the extent of the paralysis—i.e., is greater the further forward the seat of spinal severance. Experiments are quoted in detail upon dogs with severance at levels between the seventh cervical and third lumbar, and at periods subsequent to the transection varying from 21 days to 589 days to exemplify this relationship. As to cold shivering in the paraplegic dog, von Goltz considered the shivering to be spinal. Charles Richet, however, in 1893 noted that in the chloralised dog severance of the spinal cord at once confined the field of shivering to muscles headward of the spinal transection, and concluded that shivering requires a pre-spinal nervous mechanism. Sherrington and Laslett in 1903 instanced a dog retaining excellent health for 580 days after exsection of the eighth cervical spinal segment, in which free shivering, when the dog was cooled, occurred headward of the lesion, but no trace of shivering ever trespassed backwards to the muscles innervated from behind the lesion. Shivering in other dogs was absent from the paraplegic region as completely a year and a half after spinal severance as at first, and was so although the usual spinal limb and other reflexes, cutaneous and deep, were brisk and the femoral pressure as high as 122 mm. Hg. The non-appearance of cold shivering in the paraplegic region of the dog can reveal with great clearness the exact segmental level of the spinal lesion by demarcating the muscle field innervated behind the lesion from that in front—indeed, the boundary will actually subdivide an individual muscle—e.g., the anterior part of the deltoid will shiver violently when in its posterior part no shivering can be evoked. In paraplegic man also shivering fails below the lesion and could exhibit the segmental level of a traumatic lesion. Spinal transection impairs the dogs' adjustment to heat as well as to cold. The absence of heat-sweating in the paraplegic region is well known, although profuse sweating unrelated to heat may occur in the paraplegic region in patients as a spinal reflex. Summing up what he calls "these admittedly desultory observations," the author finds that in dogs long after complete subsidence of spinal shock, as judged from usual post-transection reflexes, there persists in the region innervated from behind the transection marked failure of adjustment of the surface blood-supply (paws, pinnæ, nose) to changes of surrounding cold and warmth. The failure of this vascular adjustment, though not absolute, remains severe and without improvement; along with it there is complete abeyance of sweating to heat and in muscles complete abeyance of shivering to cold. Diurnal fluctuations of 2° C. in the stall temperature affected conspicuously the vaginal temperature of cervical paraplegic dogs fully removed from spinal shock. In dogs all attempts, even after considerable exposure, to induce cold shivering in the paraplegic region as a spinal reflex entirely failed. On cold immersion of the insentient paraplegic portion of the dog, shivering occurred headward of the spinal lesion even when the skin headward of the lesion still felt, to the touch, fully "warm." Shivering under these circumstances is, on older views of the nature of the adequate skin-stimulus for "cold" difficult to explain as a reflex, but it is not precluded from being reflex on the views propounded by Ebbecke (1917) for the nature of the adequate skin-stimulus for "cold" sensation. On the other hand, shivering under these circumstances may be possibly of deep origin from direct cooling of a central (diencephalic) thermotaxic mechanism. Shivering seems not to require the afferent nerves of the lung or of the shivering muscles. Shivering reflex or "central" requires, like Richet's heat polypnœa, some central nervous mechanism anterior to the mid-brain. Instances where, under severe but short-lasting changes of surrounding temperature, the body temperature (vaginal) of

[1] THE LANCET, 1924, i., 1011.

the dogs fell to 32·3° C., or, on the other hand, rose to 42·5° C., were not productive of serious mischief, and after the animal's return to its stall at 27°–28° C., the body temperature quickly regained its approximate normal. A rise of temperature (vaginal) reaching 43·2° C., productive of delirium, profuse salivation, and acute symptoms of distress, was yet rapidly recovered from on removal to cool surroundings. It would seem, therefore, that even in high paraplegia, thermometry at somewhat frequent intervals can, as M. S. Pembrey has pointed out, notify over-stress of thermotaxis in ample time for the taking of successful measures of relief.

THE PAPWORTH VILLAGE SETTLEMENT.

AN extension of the Papworth Village Settlement was declared open on Tuesday last by the Duke and Duchess of York when a large and representative company were present. The Settlement is the practical realisation of a scheme which in its inception seemed highly imaginative or Utopian, and its value may lie as much in the example which it sets to other communities as in the practical good which it has been able to do for a certain number—now quite a large number—of sufferers from tuberculosis. The objects and the activities of the Papworth Village Settlement have been frequently noted in these columns as well as in the lay papers, and we may assume that they are quite familiar to our readers; but that sort of familiarity is as nothing compared with the appreciation of the work which will follow a personal visit. We strongly recommend anyone who has the opportunity to make an inspection of the Settlement to seize it and acquaint himself with the all-round manner in which a class, that may be among the unhappiest which modern sociology knows of, can live active and healthy lives and earn good wages, if the initial safeguards are provided, and the risks of protracted unemployment are removed. Dr. P. C. Varrier-Jones, who may be addressed at Papworth Hall, Cambridge, will give every facility for inspection, and previous reference to the description of the movement, written by him and Sir Clifford Allbutt in our columns, will be found a useful preparation for a visit (THE LANCET, Oct. 20th, 1923, 913). At the annual conference of the National Association for the Prevention of Tuberculosis, it will be observed from our report this week that the Papworth Village Settlement is regarded by experts as an acknowledged success.

THE CONDITIONS OF INDUSTRIAL EFFICIENCY.

THE Industrial Fatigue Research Board has acted wisely in publishing a short summary[1] of the conclusions arrived at in the various reports issued by the Board during the past six years. Results obtained in specific investigations tend to be forgotten, except by those interested in the particular industry, and may escape even their notice. Yet they form, when taken together, an organic whole, as may be perceived from this summary, with at least one common factor—human activity. The industries from which results have been culled include the great textile group, the metal industries, boot and shoe making, pottery manufacture, the glass and laundry trades, and repetition work. The findings are subgrouped according to (*a*) working conditions, (*b*) working methods, (*c*) administrative matters. The accumulated evidence goes far to establish that maximum output is contingent on maximum fitness of the individual worker, and that this can only be attained by providing the most hygienic and comfortable conditions and methods of work. Indications of the ways to effect at any rate improvement arise from each study. The recommendations are of different kinds. Some merely suggest promising new fields of research in which no work has yet been carried out; others advocate the adoption of certain practices with a view to the accumulation of useful data; others, again, deal with the applications to industry of the results already disclosed. Most of the recommendations have been put forward with the concurrence of representatives of the industries concerned, and it is hoped by the Board that these industries will give careful consideration to the question of giving them practical effect. Analysis of the investigations of the Board grouped by subject-matter—i.e., ventilation, lighting, or noise—is needed to establish clearly the law and order of the conclusions; such analysis is contemplated by the Board and its appearance will be welcomed.

[1] Results of Investigation in Certain Industries. Industrial Fatigue Research Board. Report No. 17. H.M. Stationery Office. 1924. Pp. 17. 6*d*.

SPECTACLES FOR SHOOTING.

THE article which we publish in another column on vision and target shooting by Mr. Wynn Wirgman explains the optical problem of correcting an error of refraction in a rifle shooter who lies in the ordinary prone position and shoots with his right eye. In this position the line of sight passes not through the mathematical centre of the correcting lens but through a point in its upper and inner quadrant. The result is that, owing to the prismatic effect of the lens, the image is displaced, and when the error of refraction is as much as five dioptres, as in some of the author's cases, the displacement may be considerable. Hence it is necessary to centre the glass so that the line of sight passes through the optical centre. To prevent distortion it is also necessary to ensure that the plane of the glass is parallel with that of the target. It is of interest to read that, acting on these principles, Mr. Wirgman has prescribed glasses for as many as 38 men who have been or are really good shots. Of course, for ordinary purposes these glasses would be quite unsuitable. The correction of refraction is thus not always the merely mechanical problem that it is sometimes supposed to be.

ANALYSED MORTALITY.

AT a meeting of the Faculty of Actuaries on June 30th Mr. Eric B. Nathan, F.I.A., read a paper entitled Analysed Mortality: The English Life Tables No. 8A. Using the census data (England and Wales) of 1911 and the deaths registered in 1911 and 1912, Mr. Nathan has constructed for each sex separately the rate of mortality (q_x) curve for each of 20 groups of diseases. It is therefore possible to display graphically the share of each group in the total mortality at any age and to follow the change in importance of each group throughout life. The curves are of much interest as some of the groupings have not been adopted before, and so detailed a study of the data derived from a short period is not available. Mr. Nathan does considerably less than justice to the General Register Office when, speaking of pulmonary tuberculosis and cancer, he remarks that "my attention was brought to the fact that even to-day there was no definite measure of the mortality due to these two scourges of the youth and middle ages of the people of this country, although partial investigations had been made, such as those of Messrs. Teece, King, and Newsholme, and more recently those of Dr. Brownlee and Profs. Karl Pearson and Arne Fisher." As a matter of fact, rates of mortality at ages in quinquennial groupings for tuberculosis, pulmonary and other forms, and for cancer, with distinction of sites, have been regularly published by the Registrar-General and commented upon by Dr. T. H. C. Stevenson for many years. It is true that in official publications the rate of mortality used is what actuaries term the Central Death Rate, and the rates have not been smoothed or graduated. But the actuary's Rate of Mortality can be easily deduced from the Central Death Rate (except at the ends of life, it does not differ from it very substantially in magnitude), and there are not many medico-statistical purposes for which a graduated function is essentially superior to the crude rates. So far, indeed, as tuberculosis and cancer

are concerned, Mr. Nathan's results have been rendered obsolete by official publications. This is not to say that Mr. Nathan's paper is untimely or uninteresting. In fact, it presents important data in a light which will be novel, but quite intelligible, to many medical readers and should receive the special consideration of the medical advisers of assurance offices.

THE STRUCTURE OF ENAMEL.

THE structure of human enamel has attracted much attention from dental histologists and has aroused much controversy. In the past the view has been generally held that enamel was an entirely inorganic tissue, and therefore could only play a passive rôle in the production of dental caries. Latterly it has been suggested that enamel may not be so devoid of organic matter as had been thought and that it might conceivably play an active part, either in predisposing to dental caries or in aiding the individual to resist the disease. The extreme hardness of this tissue has made its investigation one of much difficulty; histological evidence appeared to show that its organic content, if it existed at all, must be extremely slight. On the chemical side, the work of C. S. Tomes was accepted as indicating that organic matter was absent. Against this must be set the more recent work of Lovatt Evans, who, using the most modern analytical methods, found that enamel contained from 1 to 2 per cent. of organic matter. Hitherto it has only been possible to prepare sections of enamel by grinding. In the hands of Leon Williams some wonderful results were obtained, but it is obvious that such a method would fail to reveal any organic structure, if such really existed. The latest histological investigation by H. C. Malleson,[1] marks a notable advance in microscopical technique, for he has been able to decalcify enamel and to cut sections on a microtome after embedding in celloidin. Malleson finds that either citric acid or trichloracetic acid to which alcohol is added, allows the enamel to be decalcified without destroying its structure. The process is a long and tedious one, but the results are of great interest, for sections prepared in this way show a different structure from ground specimens. As is well known, enamel consists of prisms embedded in a small amount of cementing substance. Malleson finds that after decalcification a prism cuticle remains. This surrounds the prisms, and in transverse section is oval in shape with evidence of a longitudinal groove. This cuticle stains deeply with hæmatoxylin and is considered by Malleson to be organic in nature. Whether this interpretation is correct or not, the work marks a notable advance in histological technique, and should materially aid further investigation of the enamel. A study of the micro-photographs as well as of the actual sections, suggests that if Malleson's view be correct, the amount of organic matter must be considerable, far more than 1 or 2 per cent. That does not invalidate Malleson's view, though it suggests the possibility that even prolonged immersion in acid by his method may not entirely remove the lime salts, and that some of the residue may still be inorganic.

TYPES OF PNEUMOCOCCI IN NORWAY.

IN the May number of *Norsk Magazin for Laegevidenskaben*, Dr. T. Thjötta and Dr. O. Hanneborg have published an interesting comparison between the distribution of the various types of pneumococci in the U.S.A. and in Norway. With regard to the former country, it may be remembered that the work of the Rockefeller Institute in New York showed type I. to be present in 33·3 per cent., type II. in 29·3 per cent., atypical type II. in 4·2 per cent., type III. in 13 per cent., and type IV. in 20·3 per cent. The Norwegian investigators have followed the same technique as that of the Rockefeller Institute's hospital, and have employed sera provided by this hospital and the New York Board of Health. In the course of a couple of years they examined the sputa of 100 cases of pneumonia and they found type I. in 44 per cent. of their cases, type II. in 32 per cent., type III. in 6 per cent., and type IV. in 17 per cent. It will thus be seen that the numerical proportion of the various types of pneumococci is approximately identical in the two countries. In the Norwegian material there were only eight deaths, and this mortality of 8 per cent. is in striking contrast to the mortality of 30 per cent. recorded in the U.S.A. before serum treatment was started at the hospital of the Rockefeller Institute. The Norwegian figures are, of course, too small for such a comparison to be fair. With regard to the virulence of the various types, the Norwegian investigators confirmed the observations made in the U.S.A. that type III. must be considered the most dangerous; in the Norwegian material it was responsible for a mortality of 16·6 per cent., whereas the mortality for type I. was only 9 per cent., and that for types II. and IV. only 6 per cent. Fortunately, type III. is comparatively rare, and it is type I. which, owing to its relatively great frequency, plays a most important part both with regard to mortality and complications. In the Norwegian material 11·3 per cent. of the cases of pneumonia, caused by type I., were complicated by empyema—a complication not once seen in the cases of pneumonia in which type III. was found. Dr. Thjötta and Dr. Hanneborg have also studied the mortality rates from pneumonia in Norway since 1876, and they have come to the conclusion that the average is about 15 per cent. It is interesting to note that the yearly fluctuations of these rates throughout the country were much greater in individual hospitals—even large hospitals—than in the whole country; the hospital rates ranged from 10 to 34 per cent., whereas throughout Norway they ranged only from 13 to 18 per cent. It would be interesting to learn the reason for the mortality from pneumonia being approximately twice as high in the U.S.A. as in Norway. May it be that the stationary and homogeneous population of Norway is more resistant than the migrant and heterogeneous population of the U.S.A.? Dr. Thjötta and Dr. Hanneborg suggest that light might be thrown on this matter if information could be obtained as to the mortality from pneumonia among Norwegians settled in the U.S.A.

[1] Brit. Dental Jour., May 15th, 1924.

THE MEDICAL INSURANCE AGENCY.

A MEETING was held of the Committee of Management of the Medical Insurance Agency on June 26th, Dr. R. Langdon-Down being in the chair, in the absence through illness of Dr. G. E. Haslip. The secretary of the Agency, Mr. L. Ferris Scott, presented the audited balance-sheet for the year ended Dec. 31st, 1923, with the chairman's report, and a detailed statement made of the progress of the Agency during the last eight years. The report showed that the Agency had been able to live up to its record of introducing over £100,000 worth of new business per annum, a record established now four years ago; for in 1923 life assurance policies, totalling £101,097, were obtained, the money being assured under 102 policies, and representing a yearly premium income of over £5000. It will be of interest to those who have not happened to watch the activities of the Agency from the beginning to learn that the total sum assured through its medium, since its inception, amounts now to over three-quarters of a million sterling. The continuance of the progress in the premium income of the Agency was shown in the report by the following figures: In 1907–08 the premium income was about £1000; in 1914 it had reached £11,000; in 1922 the figure had increased to £38,000; and in 1923 the net premium income was £47,823. These are big figures for an Agency which confines its activities to one profession. An increase of business was shown during the year in the combined

household, fire, and motor car insurances; and with regard to the last, a special service now offered by the Agency has met with considerable approval. A tentative agreement between the Agency and Messrs. Mann, Egerton, and Co., Ltd., has been arrived at, by which that well-known firm places its services at the disposal of doctors insuring through the Agency; and as this scheme develops, and members become aware of it, what is now a promising start in the way of placing a reliable motor service organisation at the disposal of the M.I.A. will develop into a substantial bureau of advice to that large and increasing number of doctors who find the use of a motor car essential to their work. The rebates to doctors insuring through the Agency amounted during the year 1923 to over £2000, and the surplus from the income and expenditure account stood at the end of the year at £1595 14*s*. Interim grants amounting to 750 guineas were made to the Royal Medical Benevolent Fund (£210), the Royal Medical Benevolent Fund Guild (£210), Epsom College Benevolent Fund (£105), and the Royal Hospital and Home for Incurables, Putney (£52 10*s*.). A sum of £210 was added to the Educational Grants (Girls) Fund. As a result of this distribution, the total sum subscribed to medical charities by the Medical Insurance Agency since 1910 has reached £12,250.

TREATMENT OF ECLAMPSIA.

WE would call the attention of practitioners to the offer made by Prof. B. B. Stroganoff on p. 62 to give his services by day or by night during the next six weeks in treating any cases of eclampsia by his well-tested method. In the last 253 patients treated by this method only six deaths supervened, and these were in cases neglected before the method was applied. Senior members of the obstetric staff of general and special hospitals have already been informed of Prof. Stroganoff's readiness to treat cases, and also members of the Section of Obstetrics and Gynæcology of the Royal Society of Medicine who live in London. Prof. Stroganoff's address is 98, Philbeach gardens, Earl's Court, and his telephone number is Western 2029.

R.A.M.C. WAR MEMORIAL FUND.—The General Committee of the Royal Army Medical Corps War Memorial Fund will meet at the War Office (Room 219) on July 17th at 4.45 p.m., to decide as to the final disposal of the balance of the Fund.

INTERNATIONAL CONFERENCE ON TROPICAL HEALTH PROBLEMS.—Sir W. Arbuthnot Lane, Sir William Simpson, Sir Leonard Rogers, Sir James Kingston Fowler, and Dr. Aldo Castellani will attend this Conference, which is to be held at Kingston, Jamaica, from July 23rd to July 31st.

MIDDLESEX HOSPITAL MEDICAL SCHOOL.—At a meeting of the board of the hospital, Prince Arthur of Connaught in the chair, on June 2nd, the Dean, Mr. A. E. Webb-Johnson, announced that the sum of £20,000 had been given by Mr. Samuel A. Courtauld to endow the University professorship of anatomy in the medical school of the hospital.

INDEX TO "THE LANCET," VOL. I., 1924.

THE Index and Title-page to Vol. I., 1924, which was completed with the issue of June 28th, will shortly be published. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers wishing to receive the Indexes regularly as published should indicate this desire.

THE LANCET OF FEB. 2ND, 1924.

THE Manager of THE LANCET would like to purchase copies of the issue of Feb. 2nd, 1924, for which subscribers may have no further use. He will be pleased to pay 1*s*. each for them. Such copies should be addressed to him at 423, Strand, London, W.C. 2.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LXXIX.—THE TREATMENT OF CEREBRAL VASCULAR LESIONS.

THE term "apoplexy," if used in its classical sense, denotes a state of unconsciousness with complete paralysis, except of the vital functions, developing more or less suddenly as the result of blockage or rupture of a cerebral artery. Its onset is sometimes instantaneous, but is usually preceded by premonitory symptoms, such as headache, giddiness, abnormal sensations in or weakness of a limb, or disturbance of speech, which may last for a few minutes or days. Consciousness may be lost slowly or rapidly. The patient lies in a state of coma, breathing stertorously, with a pale or cyanosed face and flaccid limbs. He may never recover consciousness, death occurring quickly or within two or three days. Recovery when it occurs is gradual and is marked by a stage of irritability in which the patient resents interference of any kind. Ultimately he is left with some gross disturbance of function, most commonly hemiplegia.

The apoplectic attack may, however, be less severe and consist of little more than momentary loss of consciousness or giddiness, associated with hemiparesis or aphasia which may disappear in a few weeks.

Sometimes coma supervenes after paralysis has appeared, and frequently a stroke consists solely of a slowly developing hemiplegia that may become complete without any disturbance of consciousness. To an attack such as the latter the term "apoplectic" should not strictly be applied, but the original meaning of the word is now rarely adhered to. The majority of apoplectic seizures occur in patients over 40 who are suffering from arterio-sclerosis with or without arterial hypertension, cardiac hypertrophy, and renal disease. Hæmorrhage or thrombosis is the immediate cause, and one of the branches of the middle cerebral is most commonly affected. A stroke occurring in a young adult is very frequently due to syphilitic arteritis, and sometimes to embolic occlusion or rupture of a basal aneurysm.

Theoretically, it would seem to be important for the proper treatment of vascular lesion of the brain to differentiate cases of hæmorrhage from those of occlusion especially by thrombosis. And the matter might not appear to present any difficulty when the state of the heart and blood pressure can be used as an index. But pathological experience teaches that in many cases, perhaps the majority, it is impossible at the bedside to be certain of the nature of the lesion. In general, embolism is usually the cause in young people with simple or infective endocarditis; between the ages of 20 and 40 thrombosis from syphilitic arteritis is most common, and after 40 either thrombosis or rupture may occur. With embolism or hæmorrhage the onset is usually sudden in a patient with high blood pressure, hypertrophied heart, or renal disease, whereas thrombosis often develops slowly with premonitory symptoms lasting perhaps for hours and frequently occurs in the night. But the lesion may be thrombotic when the left ventricle is hypertrophied, the pulse is full and bounding, and the blood pressure is raised; on the other hand, it may be hæmorrhagic when these signs are absent. Nor is the mode of onset a sure guide, for with thrombosis, while the development of the seizure is usually slow, it may be apoplectiform, and with a small rupture the opposite may occur. The broad rules of treatment should therefore have a general application whatever the immediate cause of the vascular lesion may be.

General Management.

For a patient who is in an apoplectic seizure, or who has the slightest warnings of one, absolute rest is the

first essential. He should be put to bed with as little disturbance as possible, his room kept quiet, and the light dim. His head and shoulders should be slightly raised on a pillow, care being taken that the large veins of his neck are not being pressed upon.

If the patient is conscious, visitors should be prohibited, and he must be protected from worries and physical exertion. He ought to be fed, and must not be allowed to alter his position in bed by his own exertions. A bedpan and urinal must be employed. If the patient is unconscious he should lie on his side, preferably on a water-bed, and the nurse must see that his head does not drop forward. He may be incontinent, but if urine is retained catheterisation will be necessary and should be carried out with minimal disturbance of the patient. His skin must be cleansed with soap and water night and morning to prevent the development of bedsores, and for this purpose the nurse should use the palm of her hand. After carefully drying his skin with a rough towel, she should gently rub his back, shoulders, and buttocks with methylated spirit, and finally dust them over with boric powder. If the patient is in a restless, semi-conscious state sedatives are necessary and, provided that he can swallow, bromides or chloral, or both combined, are preferable. As a draught the following is satisfactory: Pot. brom., 20 gr.; chloral hydrate 12 gr.; aq. menth. pip. ad 1 oz. Morphia is a depressant of the respiratory centre, but in the circumstances under which it would be called for this is no deterrent to its use in moderate doses. For restlessness is not usually associated with deep coma or other signs of increased intracranial pressure sufficient to impede medullary function.

Feeding.—Whether the stroke is severe or slight it is safe and probably wise to starve the patient for the first 24 hours. If he is conscious and thirsty he should be allowed sips of water but not large quantities of fluid. If he is unconscious, care must be taken to keep his mouth clean by swabbing it out with a mild antiseptic or alkaline lotion. After the first day semi-fluid diet can be given if necessary in the form of nutrient enemata. If the patient is feeble and his heart's action is poor, alcohol and digitalis are often beneficial. Even in mild cases the diet for a few days should be light and then gradually increased. When it is clear that the cause of the stroke is rupture of a vessel it is generally considered to be good practice to promote free action of the bowels by calomel or croton oil ℥ i., followed by an enema. If the vascular lesion is clearly thrombotic, and especially if the heart's action is weak, purgatives should be avoided, but enemata and mild laxatives can be used.

Where there is good reason to believe that syphilis is the cause of the arterial disease, anti-syphilitic treatment should be early instituted. Since it is important to disturb the patient as little as possible, it is necessary carefully to choose the drug to be employed and the method of its administration. Mercury by intramuscular injection is perhaps preferable, although arsenical compounds such as glucarsenol or sulpharsenol can be given in small doses into the buttock at weekly intervals under strict aseptic conditions. As soon as the patient is able to swallow, pot. iod. gr. x. to gr. xx., thrice daily, should be given.

Are Surgical Measures Justifiable?—Many of the clinical phenomena resulting from cerebral vascular lesions are due to raised intracranial pressure from hæmorrhage and œdema or œdema alone. When coma is deep or increasing the question therefore arises whether or not active measures ought to be adopted to relieve the cerebral compression that otherwise may kill the patient. It is a question by no means easy to answer. If, in addition to profound coma, there is clear evidence of disturbance of medullary function, such as rising blood pressure associated with Cheyne-Stokes respiration and cyanosis, relief of intracranial pressure is certainly necessary, for otherwise the patient is likely to die. As to the best method to adopt, bleeding by phlebotomy at one time played a prominent part in the routine treatment of apoplexy, and if sufficiently heroic it will certainly lower the intracranial pressure. But nowadays it is rarely employed. This is not to be wondered at, for it has only a limited usefulness and under certain circumstances may be positively dangerous. Thus when the circulation through the medulla is already enfeebled from either cardiac weakness or compression it is likely quickly to lead to a fatal result. Even in cases of cerebral hæmorrhage in which the heart is acting forcibly, the blood pressure is high, and respiration is not embarrassed. Although withdrawal of blood is unlikely to be harmful, it is doubtful whether any real benefit will result from it. Venesection on the whole has little to commend it.

Withdrawal of spinal fluid by lumbar puncture is sometimes employed, but where the pressure within the skull is sufficiently great to affect the medulla it is not a safe procedure. The danger, of course, lies in the risk of herniation of the bulb through the foramen magnum. In less severe cases, however, in which signs of bulbar compression are absent, careful drainage of spinal fluid by lumbar puncture is relatively safe and often leads to rapid relief of the general cerebral symptoms.

A third available method of dealing with raised intracranial pressure is by cerebral decompression. It has been strongly advocated by Cushing for apoplexy from hæmorrhage, thrombosis, or embolism, not only as a means of saving life, but also, in less serious cases, to restrict the amount of residual disability by diminishing local destruction of tissue from pressure due to œdema or blood-clot. Our knowledge of the results of this method is insufficient for judging whether or not it should be employed to the extent that Cushing advises. But it would seem to be clearly indicated when the blood pressure is rising and Cheyne-Stokes respiration is present; in other words, when the patient's life is endangered from impairment of medullary function.

Period of Rest in Bed.—The question as to how long a patient who has had a stroke should be kept in bed can be answered only in general terms and in regard to cases uncomplicated by bronchitis, heart failure, &c. In all severe cases the patient should be kept in bed for at least a month after consciousness has been recovered and other acute symptoms have passed off. Even when the stroke has been slight rest in bed for from 10 to 14 days is advisable.

Preventive Measures.

The physician's duties do not end when the patient has recovered from the acute effects of the vascular lesion. Apart from the treatment of residual disabilities, such as hemiplegia, he ought to review his patient's mode of living in order to ascertain whether anything can be done to avoid a recurrence. Thrombosis and hæmorrhage are probably always associated with arterial disease which cannot be eradicated. But it is often possible to diminish his liability to vascular accidents. Thus when syphilis is the essential cause adequate treatment ought to be persistently carried out. Patients with arterial hypertension should avoid excesses in food and alcohol as well as in mental and physical exertion. Worry is the common lot, but such patients should, as far as possible, avoid situations that are likely to be disturbing. Their diet should be light. Meat soups, strong coffee, and heavy meals should be avoided, and a regular morning saline is beneficial.

Lastly, although any reasonable abstinence ought to be insisted upon, it should be remembered that it is easy by excessive zeal for rules and regulations to foster a spirit of hopelessness in patients with vascular disease and to make their lives more miserable than need be. In consequence their activities should not be restricted within too narrow limits.

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Special Articles.

VISION AND TARGET SHOOTING.

BY C. WYNN WIRGMAN, M.D. LOND., F.R.C.S. ENG., T.D.,
LATE OPHTHALMOLOGIST, 17TH GENERAL HOSPITAL.

THE sport of rifle-shooting is by no means so popular in the British Isles as in the Overseas Dominions. There are several reasons that may be suggested, but no doubt the principal one is that Government encouragement is lacking. In the Dominions, Government support is hearty, and in consequence many more enthusiastic rifle shots are to be found. Still, there are many here who are constant visitors to Bisley, and the "King's" winner is a person of some small consideration. I therefore venture to make a few observations on the subject of sight in rifle-shooting and the special requirements for shooting spectacles.

The Essentials of Marksmanship.

Attainment of a high standard of marksmanship results from a combination of physical qualities, to which must be added certain mental characteristics as well. The public believe that good eyesight is the one great factor, but in this they are not quite accurate. Ability to see the object aimed at is certainly necessary, but not perfect vision. Fatigue of the eye, I think, and not bad definition, is the main cause of the difficulty in scoring well for a number of consecutive shots, as required in present-day competitions. I have had the opportunity of examining the eyes of many of the Bisley competitors, and it is upon these observations that this note is based.

Many of the younger men, although not emmetropic, do not feel the need of glasses so much, because fatigue is not so easily felt in youth where the application is not constant and intense. In Bisley shooting there is an interval for rest between each shot, possibly as much as two to three minutes when three competitors are firing at the same time.

Visual Defects in Shooters.

I have prescribed spectacles for 38 men who have been, or are, really good shots. Of these I find 22 were hypermetropic, 15 needing spheres only, and 7 cylinders with or without an additional sphere; 10 were myopic, and all but one of these needed cylinders as well as spheres; 6 showed mixed astigmatism. The greatest amount of manifest hypermetropia found was +1·50 sphere and of myopia −5·50 sphere. The strongest minus cylinder was −1·50 (no sphere). Among the hypermetropes I have no note of a cylinder exceeding +·75.

The Use of the Eyes in Shooting.

In shooting two points have to be observed and aligned—viz., the mark and the foresight. In old days one would have added a third, the backsight. Nowadays the aperture sight has made this an automatic part of the alignment, and incidentally has increased the ease and rapidity of aim and shooting to a very great extent. It has also aided those with defective vision by diminishing the cone of rays. The average size of aperture used is 0·05 in. to 0·08 in., or even in some cases 0·1 in.

The majority of shooting men at the moment of firing focus the tip of the foresight, which, in the short service rifle, is approximately 32 in. from the eye. Before the final pressure is applied the attention is concentrated on maintaining the relative position of the point of aim and the tip of the foresight. I say point of aim advisedly, for some men take what is known as "a six o'clock" aim—i.e., the tip of the foresight just below the mark, others aim at the top of the target, and others at the bottom. The eye, therefore, while aiming is alternately relaxing and accommodating, finally settling for a fraction of a second in partial accommodation. It can, then, be readily understood that errors of refraction tend to cause fatigue in older shots, particularly on sunny days or when many shots are fired consecutively. Add to this the strain of using a telescope to mark the "spotting disc" and to judge the wind by the mirage and we see the main value of the correction of faulty refraction is not so much to *see* the object aimed at well, but to put the eye under the best conditions for hard use.

Correction of Visual Defects in Shooters.

In prescribing glasses the point to which I wish to draw attention is that an ordinarily centred lens is not advisable, because in the position assumed when firing the eye looks through the upper and inner quadrant of the lens. (The match rifle-shot who usually assumes the supine position is not in question, only the service rifle user.)

In the prone position the body is carried well away to the left, so that the head is inclined to the left also in the act of looking at the mark. The face is inclined at a more or less acute angle to the ground, and the right eye is slightly further from the target than the left (in a right-handed man). This necessitates the line of vision passing, as has been pointed out, through some point situated in the upper and inner quadrant of the right lens, and, if no alteration of centre is mentioned in the prescription, a prismatic and curved image is produced. To counteract this it is necessary (*a*) to raise the frame; (*b*) to centre the glass so that the line of aim and the optical centre coincide; (*c*) to bring the face of the glass parallel in the vertical plane with the target.

Theoretically the shooting glass should be angled to correspond in the horizontal plane also, but in practice this is hardly needed. It will be found that an angle of 10°–15° back from the vertical is required to fulfil (*c*). An angling joint can be used for this.

The question of the lens employed for the left eye is also of some importance. As most men shut the left eye while aiming, it might be thought that a monocle would be most convenient (with due provision for the correct axis of any cylinder used). Most men use the left eye for telescopic purposes, as mentioned above, and for this a normal centring is sufficient in a toric lens. Seeing, however, that whether the normal distance between the pupils is preserved in the centring, or whether the eyes are supposed to be used independently, the optical centres and the pupils will not correspond when the subject is walking about, it is as well to warn him to wear the glasses only when in the shooting position. With a strong minus lens the decentring causes the lower edge to be very broad, and it is as well either to order a lens smaller than usual in diameter or to cut away the lower half. With some types of aperture sight the latter is, in any case, an advantage, as the recoil sometimes brings part of the sight in contact with the base of the frame.

The glasses for big-game and game-bird shooting need not, I think, be brought under the above rules. Shots with the sporting rifle are not always taken in the prone position, and in any other position the eye is not rotated so much away from the centre of the frame; while the shot-gun user needs certainly to see his mark, but his alignment of the gun upon it is dependent very slightly on aim. Instinctive muscular control directs the barrels just as in revolver snap shooting. The proper fitting of a shot-gun to the individual's anatomical construction is nine-tenths of the making of a good game shot. In the military rifle no more than a certain alteration in the length of the stock is possible.

Much remains to be learned of the physiology of rifle shooting, both with regard to vision and psychology. The causes of bad shooting are legion, and it is not always easy to assign the proximate cause. On the whole I am inclined to think that vision is by no means the chief factor in the equipment of the great shot, but is only one of many.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS:

ANNUAL CONFERENCE.

(BY OUR OWN CORRESPONDENT.)

THE Tenth Annual Conference of this Association was held in London on July 3rd and 4th.

Visit to Burrow Hill Training Colony.

On the 3rd the delegates to the Conference proceeded to the Burrow Hill Training Colony, Frimley, Surrey, where, under the guidance of Sir Robert Philip, Dr. F. N. Kay Menzies, Dr. A. H. Macpherson, and the instructors at the colony, a tour of the grounds and buildings was made. The institution is delightfully situated, with ample ground for cultivation. There are separate blocks for sanatorium purposes, housing of the trainees, administration, and kitchen. It was stated that, up to December last, seven men out of nine discharged from the colony from the rural carpentry department had obtained employment, and 9 out of 31 from the gardens, a certain number being retained in the colony for its needs. To the inquiry made by one of the delegates as to whether or not 12 months' residence was sufficient for the necessary training, came the reply that this depended largely on the man's initiative. All produce grown is credited to the department concerned, and it was stated that the farm had become self-supporting in the space of two years.

There are two sections of the colony—the sanatorium and the training. These appear to be independent of each other, the financial responsibility for the maintenance of the patients in the former being borne by the county authority sending the patients, and in the latter as to three-fourths by the Ministry of Pensions, and as to one-fourth by the National Association for the Prevention of Tuberculosis. The entire cost of the patient per week is £2 6*s.* 10½*d.* in the sanatorium and £2 12*s.* 6½*d.* in the training section. The diet, judging from the details given, seemed adequate and varied. A point to which attention was drawn was that in the colony there was unfortunately no coöperation between the two sections, the nominees for each coming through different and independent authorities. The great difficulty in the work, to which also Sir Robert Philip drew attention, is the lack of any machinery for finding employment for the trainee on completion of his training, and in regard to this he pointed out that responsibility rests not alone on the colony, but must be shared by the authority which sends the patient. Success could only come by whole-hearted coöperation between the colony and care associations, and by the movement becoming a national one.

On Friday, the 4th, the Association met at 10.30 A.M. in the Robert Barnes Hall of the Royal Society of Medicine. Sir Arthur Stanley, chairman of the council, occupied the chair, introduced Mr. Wheatley, Minister of Health, and welcomed representatives from the Dominions, France, Holland, and the U.S.A.

The Need for Care Committees.

Mr. Wheatley said that the Conference was engaged in a work on which he himself had spent many years. The fight against tuberculosis was a winning fight, however prolonged. In 1847 there were 3189 deaths from tuberculosis per 1,000,000 living; in 1861, 2675; in 1881, 1923; in 1901, 1263; and in 1921, 854. There had been not only steady but even rapid progress, but still we had 70,000 fresh notifications of tuberculosis every year. The decline in the death-rate, he said, was closely related to improvement in social conditions, and the fall began seriously when food supplies cheapened, side by side with the improvement in general sanitary conditions which marked the latter part of the nineteenth century, and the rate of progress would be measured by the rapidity with which proverty was eliminated. Doubt, he said, had been thrown on the value of sanatorium treatment, but he thought it had proved its value in two ways—first of all, by educating the patient in the rules of health, and, again, by prolonging his life. The great problem, however, is to know what to do with the patient when he leaves the sanatorium. Only too often he had to return to the social conditions—the old hell—which he was unable to withstand when he contracted the disease, a most discouraging fact, after the expenditure of so much money and care, and one giving cause for grave concern to a Minister of Health. There was no hope of the patient being able to compete in the industrial market with the physically fit, especially in periods of great unemployment. So, just when he required additional means for additional sustenance, he was deprived even of an ordinary standard of living. Since 1919 the Ministry of Health had been impressed with the necessity of establishing care committees. Local authorities should at once organise and supervise care committees, and should establish a close, friendly, and confidential coöperation between them and the patients. The patient must be approached on terms, not of social, but of human equality. Part of their work would be to emphasise the value of good personal habits. There remained the much greater problem of how the patients were to earn the necessaries of life, for merely to maintain the patient was not good for him. In the effort to select some particular forms of work which these people could do economically, with a measure of State and voluntary help, certain experiments had been carried out—village settlements, for example—but caution was necessary in these matters. Hundreds of thousands of tuberculous people had to be provided for. Was it not possible to provide some scheme of workshops where the patient could work under favourable conditions and return to a decent home at night? The great difficulty was that of finance, and six months of experience had taught him that the Treasury remained quite independent of any political conditions.

Mr. Wheatley concluded by asking the delegates to furnish him with practical suggestions and schemes which could be made applicable to the whole country, and so help him to smooth the path of the sufferers.

Dr. F. N. Kay Menzies then read his paper on the

Part Played by Training Colonies in the Treatment of Tuberculosis,

abstracted on p. 99 of this issue of THE LANCET.

In the discussion which followed the reading of the paper, Dr. A. Sandison (Ministry of Pensions) defined the position of the Ministry, which was to carry out the obligations imposed by Parliament with reference to ex-Service men and endeavour to effect their physical restoration; also without attempting to duplicate existing organisations, to supplement the gaps in local schemes by making financial provision for the family while the patient is undergoing treatment, and, in coöperation with the Ministry of Labour, to subsidise schemes of training.

Dr. Lissant Cox (Lancashire) said that the fact that only 7 men out of 50 sent from his area, with a population of 1,750,000, to outside colonies completed their course of training was another nail in the coffin of these schemes. He thought it might be wise to merge these institutions in a sanatorium, having for its object purposeful work without the present ridiculous limitations in the time of residence. As to the village settlement, he considered Papworth, of which alone he had knowledge, a brilliant success.

Dr. Peyton (Cheshire) said the results of treatment were disappointing, while restoration to working capacity was a varying quantity which could not be guaranteed, and it was wrong to place on modern industry the incubus of tuberculous labour since, even without overhead charges, it was impossible to make consumptive labour self-supporting.

Dr. N. D. Bardswell (London) thought vocational training valuable, not so much as a means of subsequent livelihood as of rendering an otherwise tedious treatment of sufficient interest to persuade men to remain in an institution a long time. In his opinion an industrial settlement has a greater chance of

success if guided by enthusiastic voluntary effort than if fettered by the restrictions which public ownership necessarily entails.

Dr. Hefting (Minister for Labour for Holland) said that they had just begun in that country, and looked to England, for example, where he had seen much that would be useful to his own country.

Mr. Allen (Leeds) thought that settlements were the best method of dealing with the problem, although the cost rendered them impracticable. Concurrent treatment and training had little practical value, because there are certain parts of farm work which the tuberculous cannot and ought not to do. Leeds had established successful coöperation between medicine and the business world.

Mr. Thompson (Hastings and St. Leonards) stated that in his area out of nine trained men four were satisfactorily employed either at Preston Hall or at Hastings Infirmary, whilst it has been impossible to find employers of labour to take the others on.

At the afternoon meeting of Friday the Organisation of Care Committees was considered, upon an excellent paper from Lieut.-Colonel J. A. Ellis, B.Sc.

DIETARIES IN MENTAL HOSPITALS.

REPORT OF BOARD OF CONTROL COMMITTEE.

ON March 26th, 1922, a committee was appointed by Sir Frederick Willis, chairman of the Board of Control, to consider the dietaries in county and borough mental hospitals, and to report what changes, if any, are desirable, and whether a minimum dietary scale should be fixed. Dr. R. W. Branthwaite was appointed chairman, and Mr. Harold J. Clarke secretary of the committee, the other members being Dr. L. O. Fuller, medical superintendent of the Three Counties Mental Hospital, Arlesey; Mr. W. J. Gibbs, steward of the Tooting Bec Mental Hospital; Dr. Major Greenwood, a medical officer of the Ministry of Health; Dr. P. T. Hughes, medical superintendent of the Barnsley Hall Mental Hospital, Bromsgrove; and Dr. R. Worth, medical superintendent of the Springfield Mental Hospital, Tooting. The report is divided into six main sections:—

(1) Details concerning existing mental hospital dietaries; (2) the dietetic needs of the insane; (3) the model dietary; (4) administrative improvements in kitchen control and equipment necessary to carry out the model dietary; (5) the cost of the adoption of the model dietary; (6) conclusions and recommendations.

Appendices include (*a*) an analysis of mental hospital dietaries; (*b*) anthropometric data concerning the insane (by Dr. Major Greenwood); (*c*) a report on the rate of basal metabolism in the insane (by Dr. C. Gerald Ainsworth); (*d*) specimen forms of tender for purchase of meat, fish, and cocoa; (*e*) specification and drawings of a plate-warmer in use at Winwick Mental Hospital (by Mr. W. H. Houghton, A.M.I.M.E.); (*f*) the model dietary; (*g*) report on some matters concerning kitchen equipment in Canadian and American mental hospitals (by Mr. S. J. Benham); (*h*) the estimated cost at each mental hospital of the model dietary as originally circulated, with analysis.

The first section on

Existing Mental Hospital Dietaries

is founded mainly on conditions existing in 1922. It is noted that some improvement has since been made in the feeding arrangements at a few institutions. This sectionis subdivided into the following chapters:—

(1) The physiological sufficiency of mental hospital dietaries; (2) accessory food factors (vitamins) and mental hospital dietaries; (3) existing methods for the supply, preparation, cooking, anddistribution of food; (4) conclusions concerning existing dietaries.

In this last chapter the conclusions reached are summarised as follows:—

1. That there is an undesirable inequality in the construction of dietary scales throughout mental hospitals, some being well balanced and thoughtfully designed, whilst others impressed us as lacking in ingenuity.

2. That an unsatisfactory irregularity exists in the quantities of some staple articles of food supplied; a bare majority of diets being approximately correct in this particular—i.e., supplying an average quantity—whilst the remainder were either obviously deficient or possibly excessive.

3. That insufficient attention is paid to palatability and attractiveness, especially in the matter of the provision of a reasonable variety of dishes; breakfasts and teas providing the most common evidence of this defect.

4. That, although the details with which we were provided did not enable us to construct an absolutely reliable arithmetical estimate of the value of each diet scale (in terms of proteins, fats, carbohydrates, and calories), the result of analysis proved useful as confirmatory evidence, in cases where other indications suggested inadequacy or excess.

5. That it proved especially difficult for us to ignore the great difference that exists between dietaries showing the lowest and highest caloric values respectively; justifying a suspicion that the supply of food in the former is insufficient. This conclusion received support from the increased incidence of tuberculosis amongst males in the 12 institutions providing dietaries of the lowest arithmetical value.

6. That there seems to be some ground for suggesting that mental hospital dietaries may be deficient in certain accessory food factors (vitamins); probably deficient in fat-soluble A, and possibly also in water-soluble B.

7. That, when markets are available, some modification in the usual methods adopted for obtaining supplies is desirable, with a view to securing a greater variety of meat foods, with due regard to economy.

8. That every effort should be made to maintain a sufficient supply of high grade milk, the daily amount provided being inadequate in some mental hospitals and unduly restricted in others, and that, in order to secure good quality, especially in the matter of fat-content, routine analysis is essential.

9. That there are grounds for the suggestion that the complete substitution of margarine for butter has eliminated one of the most valuable sources for the supply of fat-soluble A, and that the partial reinstatement of butter is desirable.

10. That some institution dietaries would be improved by the more frequent and regular supply of fresh (especially green) vegetables, and fruit, and that, in order to carry this into effect, the close coördination that exists in many institutions between the farm management and the person responsible for kitchen supply should be universal.

11. That, although some mental hospital kitchens have been kept up-to-date, there are still many that are so inadequately equipped as to be incapable of anything more than the simplest routine cookery, whilst there are a large number that would be capable of still better work if provided with improved facilities.

12. That there is need for greater attention, in many institutions, to kitchen organisation, methods of transport, and ward equipment, in order that the supply of hot food to patients may be secured.

13. That there is reason to believe that smooth working, efficiency, and economy would result from the placing of all duties relating to the supply, preparation, and distribution of food, under the supervision of one individual, who should be responsible for their proper execution.

The Dietetic Needs of the Insane.

As to the dietetic needs of the insane, the committee conclude that the bases set out in the Report on the Food Requirements of Man, by the Food (War) Committee of the Royal Society,[1] are as applicable to patients in mental hospitals as they are to the general population, with certain modifications[2]; that the figures of body surface, used in that report for the computation of minimum energy requirements, should be adopted as applying with equal force to the insane population; that it is necessary to allow for patients in mental hospitals, as did the Royal Society's

[1] Harrison and Sons, March, 1919.

[2] The only modifications considered necessary are the substitution of 11 for 8 hours' sleep and the estimation of an average "work" allowance of 400 calories net energy for both sexes, or about one-third more than the Royal Society's Committee estimated for a tailor. The chief consideration that led to the adoption of the latter modification was the fact that, although only a comparatively small proportion do really hard work on farms or in gardens, kitchens, laundries, &c., others not so employed are expending energy for a fair part of each day in ward work, if only "pottering about," in restless or aimless movement in wards or airing courts, or in muscular exercise accompanying even moderate excitement or mental irritability. All such patients expend more energy during the course of a day than does a tailor at his occupation.

Committee for the general population, a 10 per cent. increase to represent the difference between food as purchased and food digested, and a further addition applicable even in the most sedentary occupations of 300 calories per diem for "locomotion"; that upon the grounds detailed in the foregoing paragraphs the net energy requirements of male and female patients in mental hospitals, in terms of calorie values, may be calculated at approximately 2800 for males and 2500 for females. These figures should be regarded as standard minimum figures applicable to the ordinary population of mental hospitals, and there should be an addition of suitable energy values in the case of individual patients who are really actively employed.

The Model Dietary.

It was obvious that any attempt to impose a hard-and-fast standard dietary, for use in all mental hospitals, would be doomed to failure. Patients vary in type in different institutions, which, again, are conducted under widely different conditions. Moreover, it was considered important that nothing should be done to tie the hands of managing authorities to such an extent as to cripple enterprise or interfere with the exercise of ingenuity. It is emphasised in the report that the scale suggested for winter months is not to be regarded in any sense as a fixed dietary for universal use, but merely to serve as a model for the guidance of visiting committees, to show what are regarded as the food requirements for ordinary patients in a mental hospital, and to demonstrate the possibility of providing a dietary, in which a reasonable variety is maintained, at a moderate cost.

A Model Dietary (Abridged) for Adult Patients During Winter Months.

Breakfast (daily).—Males, 6 oz. bread; females, 5 oz. bread; tea, coffee, or cocoa, 1 pint; margarine or butter, ½ oz. With one or other of the following extras: Galantine of beef, brawn (beef or pork), veal loaf, breakfast sausage, corned beef, bacon, rissoles, black puddings, fish cakes, kedjeree, kipper, bloater, haddock, egg, marmalade, jam, cheese, macaroni cheese, or porridge. The allowance for each patient, on alternate days with ½ pint porridge, is 2 oz. of any of the above-mentioned prepared meats, 4 oz. dried fish, or 1 oz. cheese or jam. Butter should be mixed with margarine in the proportion of 25 per cent. of the former to 75 per cent. of the latter, or be given (½ oz.) in place of margarine at seven breakfasts or teas (at least) during each two weeks. From April to September stewed fruit, marmalade, jam, &c., may replace porridge. In no case should breakfast consist of a beverage and bread and margarine (or butter) only.

Dinners (October–March).—The allowances are as follows:—

	Males.	Females.
Meat, uncooked, and including bone	6 oz.	5 oz.
Bacon, boiled, ditto	3 ,,	2½ ,,
Fish (including bone-cleaned, ready for cooking)	8 ,,	7 ,,
Rabbit or meat pie or pudding	20 ,,	17 ,,
Soups	1 pint	1 pint
Stews	1 ,,	1 ,,
Potatoes (unpeeled and uncooked)—		
Only with fish	9 oz.	7 oz.
In addition to fresh vegetables with roast or boiled meat dinner	7 ,,	6 ,,
With stew	8 ,,	8 ,,
Fresh vegetables—i.e., greens, carrots, parsnips, turnips, onions, &c.	6 ,,	6 ,,
Bread	2 ,,	2 ,,
Puddings (flour), such as jam, treacle, raisin, currant, date, fig, ginger, bread, &c.	8 ,,	8 ,,
Puddings (milk)—rice, sago, tapioca, semolina	½ pint	½ pint
Bread and cheese—		
Bread	2 oz.	2 oz.
Cheese	1½ ,,	1½ ,,

Alternative dinner dishes are hot pot, cottage pie, shepherd's pie, sea pie, liver and bacon, pork and beans, sausages, curried meat or rabbit, haricot ox tails, tripe and onions, &c. An apple, orange, or banana should be given for dessert (or at tea) at least twice a week throughout the winter months.

During the summer some of the hot dinners should be replaced by cold, accompanied by salads, lettuces, radishes, tomatoes, &c., and fresh fruit puddings or stewed fruit substituted for some of the heavier suet puddings; fresh uncooked fruit should be regularly supplied when obtainable at reasonable cost.

Tea (October–March) (daily).—Males, 5 oz. bread; females, 3 oz. bread; cake, 3 oz.; margarine or butter, ½ oz.; tea, cocoa, or coffee, 1 pint. With one or other of the following extras: Jam or marmalade, seven times per fortnight, 1 oz. each patient; meat or fish paste, bloater, or shrimp and salmon, &c., seven times per fortnight, ½ oz. each patient.

The supply of cake should be varied, being made either with currants, sultanas, raisins, or carraway seeds. Scones, buns, or oatmeal biscuits of the same weight may be issued in lieu. During summer months the jam or pastes should be replaced by fresh vegetables or fruit. Lettuces, onions, tomatoes, radishes, watercress, mustard and cress, or beetroot are desirable foods, for the regular provision of which arrangements should be made.

There follow tables showing a sequence of dinner meals for male and female patients, respectively, covering a period of four weeks, designed to demonstrate the amount and kind of food that, in the opinion of the committee should be provided for this particular meal in order to secure sufficiency and variety. It is suggested that the order of these meals should be changed at the end of each four weeks, so that no particular dish can become associated with any particular day.

A typical week's menu is:—Sunday: Roast beef, potatoes, greens, milk pudding. Monday: Lentil soup, golden pudding. Tuesday: Rabbit pie, greens. Wednesday: Boiled mutton, potatoes, onions, jam roll pudding. Thursday: Meat stew, potatoes, dumplings. Friday: Fried hake, potatoes, raisin pudding. Saturday: Meat puddings, greens.

The total issues of this week's dietary in pounds per week for 100 male patients and for 100 female patients are set out below:—

Foodstuff.	Males.	Females.	Foodstuff.	Males.	Females.
	lb.	lb.		lb.	lb.
Beef	93¾	82¹³/₁₆	Sago	3½	3½
Mutton	37½	31¼	Rice, tapioca, sago, semolina	6¼	6¼
Rabbits	37½	31¼			
Fish (hake)	50	43¾	Baking powder	15/16	15/16
Potatoes	293¾	253¾	Golden syrup and jam	12½	12½
Greens	112½	150*			
Other vegetables	121¹⁴/₁₆	81⅝	Sugar	6¼	6¼
Suet	33	31¼	Raisins	6¼	6¼
Flour	98¹/₁₆	90⅝	Bread	110¹⁵/₁₆	110¹⁵/₁₆
Barley	3½	3½	Milk	50 pints.	50 pints.
Lentils	6¼	6¼			
Split peas	3½	3½			

* It is not easy to understand why 100 female patients should be held to require 37½ lb. more greens during the week than 100 male patients. The greens are presumably given mainly to provide bulk and vitamins and can hardly be intended to replace the extra supply of protein foods suggested in the male dietary.—ED. L.

Details of ingredients for all the dishes suggested are appended, even to the amount of tea, sugar, and milk to be used for 100 pints.

The extreme variation in the expenditure of energy by patients rendered the construction of a model dietary, scientifically adjusted to suit the requirements of all patients in mental hospitals, an impossible task. The committee decided to regard all inmates of mental hospitals as falling within one or other of two categories: (*a*) the physically fit, or approximately fit, whether workers or non-workers, and (*b*) the infirm and sick. On this basis the model dietary should apply to nearly 75 per cent. of all patients in mental hospitals. In some of the dietary scales in current use supplied to the committee the evidence seemed to point to the diet of non-workers being barely sufficient, whilst that for workers had in general the appearance of being generous; a condition doubtless designed to encourage work, for therapeutic and economic reasons. Whilst the committee are in full agreement with the exercise of all reasonable efforts to induce patients to occupy themselves for their own advantage and that of the community, they are not satisfied that reliance upon additional food to produce this result is altogether justifiable. Many of the unemployed are physically unfit for regular work and need a good dietary for therapeutic reasons, and many are non-workers because of mental disease, although physically fit. They think that if the full dietary is extended to non-workers also, so far as it reasonably can be, the incidence of diseases such as tuberculosis and dysentery will be proportionately diminished. The establishment of a token system and the provision of facilities for the purchase of luxuries may be used to provide the necessary stimulus to effort among those who can work.

A Minimum Dietary.

The committee are of opinion that no dietary for ordinary patients in any mental hospital (including both workers and non-workers, and excluding the infirm and sick) should be allowed to fall below the nutritive and calorie values of the model, and that no dietary should be less varied in character than is indicated in their model scales. The dietetic requirements of the infirm and sick are matters that must be left to the discretion of the medical staff, and the substituted dietaries proposed for the infirm are therefore merely tentative suggestions.

The fourth section of the report is devoted to the administrative improvements necessary to carry out the model dietary, the chief of which appears to be the delegation of responsibility for the supply, cooking, and distribution, and service of food to one person. The committee advocate, in order to secure a better food supply and greater economy, a general improvement in the status of stewards, and the gradual conversion of the holder of this post from one who is now little more than a machine into an administrator with responsibility, and proportionately increased remuneration. They do not suggest, however, the wholesale transformation of existing stewards into food controllers because they happen now to be stewards, or any general disturbance of existing conditions in order to bring such a scheme into force immediately. The development must of necessity be a gradual one. As to the kitchen, this should be controlled, under the guidance of the person who is responsible for general direction, by one who is willing to abandon old routine methods, adopt new ones, and show readiness to exercise ingenuity in the production of a dietary at the lowest cost compatible with a good and varied scale. Great care should be exercised in the choice of the head of the kitchen staff; the committee recommend the abolition of the designation "cook" as denoting more a domestic servant than a responsible officer, with the substitution therefore of "kitchen superintendent" or "kitchen supervisor." Such a scheme would, no doubt, necessitate a higher rate of remuneration, but this is indicated in any case in many hospitals, and should be made dependent upon efficient administration. As to kitchen equipment, a list is given of items of equipment of proved value only, all of which are useful adjuncts from an economic standpoint.

Cost of the Adoption of the Model Dietary.

Unfortunately a comparison between present expenditure on food in mental hospitals and the cost of the adoption of the model scale was not easy to make, as so many mental hospital authorities are unable to produce details concerning food supplied to their patients as distinct from that provided for staff. The committee strongly urge the desirability of separate accounting in future, as is done in establishments under the control of the Metropolitan Asylums Board. In the absence of separate data it is difficult to decide whether an institution is conducted with due regard to economy or not, and, if not, where the fault is to be found. When food expenditure for staff and patients is grouped under one heading, the total cost of the two may not call for comment; whereas, if dissected, it may be found that the outlay on patients' account is unreasonably low, and that for staff unnecessarily high. In order to obtain some definite data on which to base an estimate of the cost of the suggested model dietary, copies were circulated to medical superintendents of 95 mental hospitals, accompanied by a schedule containing the exact quantities of all articles for an average week for 100 patients, 50 of each sex. The discrepancy between the replies received is astonishing. In one mental hospital (Plymouth) the total cost of the provisions is £33 17*s.* 10*d.*, with a range of values at other places down to the lowest (Lancaster) £18 2*s.* 2*d.* Extremes of estimated cost are conspicuous under every item of expenditure—due, in part, to lack of uniformity in methods of purchase, to variety in character of material obtained, or to the accessibility or inaccessibility of markets, but in the main, it is thought, to the absence of any proper principle governing the charging up of home produce at regulated prices.

In commenting on the variations in the returns as to meat, potatoes, and vegetables, it is pointed out that the prices charged for articles supplied from home farms should represent current local market figures. It is probable that in many instances prices are unduly inflated in order to show a profit on farm management. For example, the main supply of milk is obtained from hospital farms, but the price at which it is invoiced to institutions varies from 9*d.* to 2*s.* 6*d.* per gallon, a difference in cost that can hardly be justified. The cost of the model dietary according to the average of the estimates from 95 institutions would work out at 8·2*d.* per head per day, and should not in the considered opinion of the committee exceed 8·5*d.* in county and 8·75*d.* in borough institutions. Whether or no these figures exceed existing expenditure on food in the majority of hospitals, the committee are of opinion that no local authority can consider the amounts as other than economically justifiable.

The report ends with the following

Conclusions and Recommendations.

1. That there should be more uniformity in the construction of mental hospital dietary scales, especially in regard to (*a*) the character of food given; (*b*) its total amount; (*c*) the amounts of certain staple articles of diet; and (*d*) the avoidance of monotony.

2. That the average calorie values of dietaries for ordinary patients in mental hospitals (including workers, and excluding those on substituted diets) should not fall below 3220 for males, and 2875 for females.

3. That to ensure the presence in dietaries of necessary accessory food factors (vitamins) there should be a partial reinstatement of butter as a regular article of diet, a supply of milk in greater quantity, an increased provision of green and other fresh vegetables, a more common use of eggs, a free administration of salads and fresh fruit, and a more general use of wholemeal or germ bread.

4. That, as these improvements would be secured by the adoption of our suggested model dietary, and as, under proper conditions, the cost of this dietary at present prices should not exceed 8½*d.* per head per day for county mental hospitals, and 8¾*d.* for borough institutions, we commend its general adoption in public mental hospitals, with such modifications as may be necessary to meet varying local conditions.

5. On grounds of economy as well as efficiency it is important: (*a*) To establish a unified food department in each institution, under a competent and responsible head, for dealing with the supply, cooking, distribution, and service of food; (*b*) to provide each institution with adequate kitchen equipment; (*c*) to endeavour to secure, as kitchen workers, the services of persons more highly skilled in cookery by making these posts more remunerative and attractive. This refers more particularly to the responsible head; and (*d*) to pay greater attention in many hospitals to other points dealt with in the body of this report relating to the cooking, distribution, and service of food.

6. That substantial economies can be secured by paying greater attention to the terms of specifications and contracts, and by taking more advantage of wholesale markets.

7. That, in regard to food expenditure, separate accounting, as between patients and staff, should be the rule in all mental hospitals.

8. That it would be a great advantage if an officer skilled in these details could be appointed on the Board of Control staff temporarily, to advise and assist local authorities in regard to the adoption of the model dietary.

The committee desire to acknowledge the marked ability with which Mr. Harold J. Clarke has discharged his duties as secretary.

CONFERENCE ON INFANT WELFARE.

THE Third English-speaking Conference on Infant Welfare was opened by Mr. Wheatley, the Minister of Health, at Caxton Hall, Westminster, on July 1st, Dr. G. F. Still presiding. There were about 700 delegates present from 30 different countries.

Mr. Wheatley said that their object was not to relieve mothers, but to train and help them. No governing body could replace the mother. Maternal mortality from childbirth had not declined, and his department was giving great attention to this preventable mortality and the morbidity which was inevitably associated with it. A circular would shortly be issued to local authorities reminding them of their powers. The first essential was care of the expectant mother. By medical inspection in the schools the future mothers would be physically better; by the teaching of mothercraft they would be better equipped mentally. Three things were necessary: antenatal medical supervision, a more highly skilled obstetric service, and homes safe for confinements. Until better homes were obtained more lying-in hospitals and homes were needed. The number of lying-in homes aided by the Ministry was 135 and he hoped many more beds would soon be available. These lying-in homes had a great educational value. Infant mortality had been halved since 1900, and he believed the reduction was largely due to those engaged in child welfare work. There were still black spots in industrial districts and they must bring opportunity to those in need and not rest content until the worst wards of a town were as good as the best. In introducing a system for the care of expectant mothers they had to combat prejudice and conservatism. They needed a greater army of helpers and, if they were to succeed, the help given must not be tainted by charity or patronage. The workers engaged must get down to the same human, if not the same social level, as those to be helped. Health visitors needed a very thorough training. It was slower work training a health visitor than training a "dilutee" for building houses. The period of false economy was over. We could afford to spend more in the preservation of our young. The present Government was prepared to make grants in aid of any well-considered scheme submitted by a local authority.

Training of Midwives, Health Visitors, and Nursery School Workers.

Colonel R. J. Blackham described the appalling conditions under which childbirth takes place in India, partly owing to the religious prejudice that the lying-in woman is ceremonially unclean, partly to the belief that fresh air is dangerous to mother and child, and, lastly, owing to the ignorance and superstition of an hereditary caste to whom for centuries custom has consigned the care of all parturient women. Colonel Blackham gave a graphic description of how confinements are usually conducted by these "handy-women" known as *dais*. He went on to show how, at the instance of Queen Victoria, Lady Dufferin, the wife of the then Viceroy, started a fund to provide women doctors in 1885 and how this work has since spread. He described briefly the work which was being done by properly trained midwives in Calcutta, Delhi, Madras, and Bombay, showing that a definite movement is now in progress to combat the social and semi-religious customs which are responsible for the terrible dangers which have hitherto attended childbirth in India.—Dr. A. Souza (India) mentioned that the infant mortality in India was still about 600 per 1000 births.

Dr. Ethel Cassie (chief medical officer for child welfare, Birmingham) followed with a practical paper on the training of midwives and pointed out many of the weak spots and difficulties. The midwife was usually engaged about the seventh month and very little was done in the matter of antenatal inquiries. There were too many vaginal examinations and few midwives practised abdominal palpation. The visits during the puerperium were not sufficiently frequent to prevent delay in summoning a doctor for a rise of temperature. Midwives attended too many cases to do their patients justice. Medical practitioners when called in did not arrange to visit when the midwife was present, and therefore could not instruct her directly. The teaching of infant care to pupil midwives in maternity hospitals lags behind modern standards. The larger training schools have antenatal clinics, but this is not yet general. Independent midwives who are recognised teachers of midwifery cannot give instruction in antenatal work. The pupil midwife must have such instruction from a medical expert. Pupil midwives, during their training, should be enabled to see something of puerperal sepsis and should have practical instruction in the use of silver salts as a prophylactic against ophthalmia neonatorum, and should also be taught how to bathe an inflamed eye. They also needed to learn more with regard to venereal diseases. Above all the training of the pupil midwife failed with regard to the management of the mother's breasts and lactation. The nursery of every training school should be under the direction of a child specialist. All these suggestions implied a longer and more expensive training and if, in addition, the midwife were to take fewer cases her financial position must be by some means improved.

A paper on the training of the health worker by Dr. Janet Lane-Claypon brought up the vexed question as to whether the full training of a hospital nurse was a desirable or necessary preliminary to the career of a health visitor. In the subsequent discussion it appeared that most local authorities expect a health visitor to have the triple qualification of a fully-trained nurse, a certified midwife, and to be the holder of a recognised certificate in child welfare. It was agreed on all hands that whatever the training the personality of the health visitor was of supreme importance.

Miss E. Stevenson (principal of the Rachel Macmillan Nursery School, Deptford) read an interesting paper on these pioneer institutions. These schools need superintendents with a many-sided experience and a considerable power of initiative. The staff comprises, first, the heads of the shelters, whose work is being determined by the experiments now in progress, the Froebel Higher Certificate being one of the qualifications accepted; secondly, the student apprentices who work in the shelters; and thirdly, there is room for a large number of voluntary workers who will profit much by a training of, say, one year in the management of little children.

The afternoon session was devoted to the question of the

Unmarried Mother and Her Child.

Mr. Neville Chamberlain presided at the opening, and was succeeded in the chair by Mrs. H. A. L. Fisher. Mr. Chamberlain pointed out that there were more births in France than in England in 1923, and that there were 73,000 infant deaths in France to 52,000 in England, the infant mortality in France having been 96 while that in England was 69. Infant mortality in England among illegitimate children was, however, more than double that among the legitimate, and the damage-rate was certainly correspondingly excessive.

Dr. Letitia Fairfield, barrister-at-law, in an informative paper, dealt with the legislation of various countries at different times affecting illegitimacy. England was exceptional in the rule of "once illegitimate always illegitimate."

Miss J. E. Higson (Liverpool) spoke on the great need for residential accommodation for the unmarried mother and her child. She expressed her approval of the inspection, at present carried out by the Ministry, of homes for the unmarried mother and her child. One of the great needs was more accommodation in such homes, so that the expectant mother could be

admitted during the antenatal period both for physical and psychological reasons. The staff of these homes was often inadequate to meet the strain of the work. Smaller homes, although more costly, were much better. Care should be given to secure that the furnishings were bright and attractive and the dresses worn becoming. The Liverpool guardians were exceptional in having appointed a staff of welfare workers to care for these mothers. Miss Higson pleaded for more sympathetic treatment of the woman who had her second illegitimate baby.

Dr. Julius Levy (U.S.A.), in a paper entitled the Prevention of Foundlings, described the system in vogue in New Jersey. A supervisor of unmarried mother work is appointed, who visits the hospital where the mother is confined, and works out a plan whereby the baby can be kept with, and nursed by, its mother. In about two-thirds of the cases relatives are persuaded to take the mother and her baby. During the last four years 90 per cent. of the babies have remained with their mothers for three months and 76 per cent. for six months. It is claimed that since the scheme was started the infant mortality-rate among the illegitimate babies has been about the same as that prevailing among legitimate.

The keynote of the discussion was that every effort must be made to keep mother and child together. There is, of course, general agreement that this arrangement should hold until the baby is weaned, but the speakers did not throw much light on the problem of how to find a permanent home for the illegitimate child with its own mother.

The discussion on

Child Adoption

on the second day was the complement to the discussion on illegitimacy. Mrs. D. Margesson (London) (hon. secretary of the National Adoption Society), Mr. G. B. Hurst, K.C. (London), and Dr. H. D. Chapin (president of the Children's Welfare Federation, New York), made out an unanswerable case for legalised adoption. England is one of the few civilised countries in which adoption is not yet legalised. If adoption were legalised a large number of homes would be available for the maintenance of derelict children. As Dr Chapin puts it, "Homeless children should be put in the childless homes to the lasting benefit of both." And again, "To be brought up in a precarious manner by the hard uncertain struggles of an unmarried mother without normal home-life and with the stigma of illegitimacy hanging over its head is not a happy outlook" Or to quote Mrs. Margesson: "It is a fact that there is no natural place, economically or socially, for an unmarried mother and her child to live together in a civilised country." There is no need for the National Council for the Unmarried Mother and her Child and the National Adoption Society to remain in opposite camps. There is room for both. There are no doubt a considerable number of cases where the unmarried mother and her illegitimate child can make a good home with relatives. Failing that, surely the legal adoption of the child into a good family is the best solution of the problem.

Lady Nott-Bower mentioned that adopters would not be forthcoming for the child of a mentally defective mother, but surely no child should be left to the care of a feeble-minded mother. The remedy for this last problem is obviously the better supervision of mentally defectives.

Another part of the morning session was devoted to discussing the

Overseas Settlement of Children.

Sir Arthur Lawley gave an interesting account of the farm school established in Western Australia by Kingsley Fairbridge, a Rhodes scholar, who took out 35 boys. The scholars now number 200, 100 girls and 100 boys. The school has been wonderfully successful.—Mr. Percy Roberts described the large-scale operations of Dr. Barnardo's homes in sending boys to the colonies and the wonderful success obtained.—Dr. Mildred Thynne (maternity and child welfare medical officer, Bermondsey) described the obsolete Board of Trade regulations with regard to the diet of children on ocean steamers. Fortunately the shipping companies are not content with the Board of Trade's minimum, but Dr. Thynne made out a case for greater attention to this important matter.—Dr. E. W. Morris (the representative of the Australian Commonwealth) described the careful measures which were taken to safeguard the health of children during the voyage to Australia. He further said that among the emigrated children there were no failures. Failures occurred among adult and middle-aged persons owing to faulty selection.

Day Nurseries.

In the afternoon session the Hon. Mrs. Eustace Hills, who presided, dealt with the educational value of day nurseries to the parents who utilised them.—Sir Bruce Bruce-Porter read a paper on the Preventive Side of Day-Nursery Work and Dr. Crichton Miller one on the Psychological Benefit to children of being in a Day Nursery.

The morning session of July 3rd was devoted to the consideration of the

Available Measures for Securing Healthy Pregnancy and Safe Delivery.

The principles on which the new system of preventive midwifery should be founded, as contrasted with the emergency midwifery which has hitherto been the rule, were ably expounded by Lady Barrett. The move which is being made in the same direction in the U.S.A. and the Dominion of Canada was dealt with by Miss C. van Blarcom (New York) and Dr. Helen Macmurchy (Canada).—Dr. E. W. Morris, who presided, uttered a word of caution from the experience of Australia as to the need for safeguarding the proper expenditure of the maternity benefit.—Dr. Amand Routh described the growth of antenatal work in London during the last ten years. Representatives from New Zealand, British Columbia, Singapore, the Leeward Islands, and India described the development of this work in their respective countries.

Among the many important points made by Lady Barrett were the following: We must get rid of the prevalent idea that it is the lot of women to endure. Every lying-in home should be affiliated to a fully-equipped woman's hospital. There should be special sessions at the larger maternity centres for venereal diseases. Gonorrhœa is quite an important cause of puerperal sepsis. Better training of doctors and midwives, especially in the early symptoms which lead to morbidity and mortality, is urgently needed. The causes of abortion have been insufficiently studied, and hospital beds are required for cases of threatened abortion. The education of all sections of the public is necessary in order that the money may be forthcoming for combating the present deplorably high maternal and neonatal mortality.

Propaganda and Visits.

The last session, held under the auspices of the National Baby Week Council, discussed the most effective methods of propagandism on maternity and child welfare. In addition to the ordinary sessions many lectures and visits to institutions engaged in maternity and child welfare work were arranged for the delegates. Special meetings were arranged for Poor-law guardians and by the Eugenics Education Society. The Association of Infant Welfare Centres discussed Toddlers' Playgrounds and the reorganisation of health visiting schemes at a special meeting. The annual meeting of the Maternity and Child Welfare Group of the Society of Medical Officers of Health was held on July 3rd, and all medical representatives attending the Conference were invited to be present. Prof. E. Mellanby opened a discussion on the treatment of babies suffering from malnutrition, and indicated the results obtained by him at the Sheffield Infirmary by the employment of a carefully adjusted vitamin-rich diet.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Effect of X Rays Upon the Pregnant Myomatous Uterus.

AT one of the recent meetings of the Vienna Medical Society Dr. Schilles demonstrated the case of a woman, 43 years of age, who had repeatedly applied for help in order to be relieved from her sterility, which was due to myomatosis. In 1906 and 1912 she had had spontaneous abortion, and in 1918 again severe hæmorrhage had set in. The diagnosis of extensive myomatosis had induced her surgeon to advise excision of the uterus but she refused, and a series of sittings under X rays was instituted in 1920 and 1921, with only partial castration resulting. Patient had hæmorrhages occasionally, and next year she became pregnant. When admitted to the gynæcological clinic in her ninth month, eclamptic attacks supervened and she had to be delivered rapidly, a high forceps extraction being performed. The baby was born in an asphyxiated condition but could be revived. The puerperium was normal for one week, but on the seventh day high fever set in, and a diagnosis of necrosis of myomatous nodules was made. A supravaginal amputation was made and the patient left the hospital later in perfect health. In the specimen a large number of small and large nodules was found. These had no doubt previously hindered impregnation or the development of the fertilised ovum, as has been shown to be the case in similar instances by Olshausen and Lawdan. The application of X rays had, however, produced such a shrinkage of the obstructing myomatous growths that the mucous membrane had regained its capacity to retain the ovum. It is well known that metrorrhagic conditions can be influenced by careful dosage of X rays. The sterility which follows as a rule upon well applied full doses of X rays may be only temporary; one case is known in which after an interval of 14 years, in one of the first cases treated that way, conception took place. Other instances in which women have been rendered capable of bearing a child to full term by means of X rays have already been reported by Steiger, Zangemeister, and Schuhmann.

An Anti-Smoking Campaign.

An appeal to all medical practitioners has just been published, in which their coöperation is demanded in the effort to suppress, or at least cut down, the habit of smoking. In a leaflet, sent to every individual doctor, it is pointed out that over 80 per cent. of all the nicotine contained in the tobacco flakes or leaves goes over into the smoke. According to the pharmacologist Kobert, the poisonous effect of nicotine is equal to that of prussic acid, and affects all the systems of the body—the cardiovascular, alimentary, respiratory, and nervous. In the opinion of Erb (Heidelberg) it is one of the chief ætiologic factors in producing early arterio-sclerosis, and all smokers show earlier or later distinct disturbances of the innervation of the vascular system. Spasmodic conditions, like angina pectoris, dysbasia angiosclerotica (Erb), temporary unconsciousness, neuralgia, vertigo of all types are frequent at the age of 40–50 years in inveterate smokers, also early sudden death due to heart failure. Frankl Hochwart (Vienna) has illustrated the serious dangers to the nervous system in a series of 1500 case-histories obtained from well-to-do private patients, and the pathological changes in sight and hearing, besides the predisposition to cancer of lips and tongue in obstinate smokers, are well known to all doctors. Other students in France, in America, and in Sweden have come to the same conclusion that nicotine is one of the most potent factors in the increasing morbidity of civilised life. The leaflet urges the profession to discourage the custom of smoking in bedrooms and sitting-rooms or in public localities where numerous non-smokers also assemble. Especially where children are concerned, smoking should be strictly prohibited, and adolescents should under no conditions be permitted to indulge in the habit since it tends to promote weakness of the will, apart from harmful effects upon physical development. In subjects prone to catarrhal conditions the inhalation of smoke-laden air is apt to cause further deterioration of the delicate respiratory organs. A characteristic of the modern trend of feminine independence is the unrestrained smoking by girls and women. Their nervous system is easily brought into disorder by an excess of smoking, and there is a group of physicians who attribute female sterility to abuse of tobacco. From an economic point of view, the leaflet says, it is well worth knowing that the daily expense of the Austrian population for tobacco exceeds the annual deficit of all our tuberculosis sanatoriums, some of which had to be closed down for want of funds. The costs of two new tobacco factories erected by the State were not much below that sum. The sums saved yearly by a non-smoking community of 6½ millions would be sufficient to pay the entire Government debts in two and a half years and defray the costs of over 40 per cent. of the annual budget in addition. The appeal to the profession does not intend to inform the doctor of the detrimental effects of smoking, but to induce him to collaborate in the prophylaxis against the evil. Medical men are exhorted to unite in bringing about legislation against juvenile smokers, and to set an example in abstaining from smoking themselves. The leaflet is also intended to be laid out in the waiting-rooms of the doctors, and the signatures of 30 leading professors of medicine appended would seem to indicate that the appeal is not merely faddist propaganda. The ill-effects due to smoking have obviously been magnified, and in some instances ancient surmises, long discredited, have been revived by this circular; but the argument of economy excuses all this.

Public Health Services.

REPORTS OF SCHOOL MEDICAL OFFICERS.

Hull.

Dr. J. W. Fraser reports that the only condition where any deterioration has been found since last year is in the state of the children's teeth. Cleanliness is no worse, nutrition slightly better, there has been no special prevalence of disease, and fewer children have required school meals. 14,169 children were examined in the code groups, 4796 special examinations and 4150 re-examinations being made; 10·3 per cent. of the code group were found to require treatment. A system of payment for treatment at the clinics has been introduced, and the figures available for the first two months of the new system show a marked fall in the number of attendances. Attendances for minor ailments fell from 14,477 in the two months to 12,871, and dental attendances from 1394 to 1296. It remains to be seen whether an apparent fall in the incidence of disease is or is not attributable to the introduction of the payment system. The number of cases of skin disease, which had mounted so high after the war, has now happily dwindled to below pre-war figures. The two school dentists report a continual decline in the state of the children's teeth, a relapse which has steadily been taking place for the last three years. The number of 5-year-old children brought to the dentists' notice during the year suffering from extensive dental caries has been alarmingly large; many of them have exhibited an almost complete absence of enamel formation. It would be interesting to know to what this condition among the 5-year-old group can be definitely attributed, and whether it is a condition noted by school dentists in other parts of the country or is indigenous to Hull alone. The report by Mr. Bates, the organiser of physical training, shows a remarkable extension of out-of-school activities.

School playgrounds can be used between 4 and 6 in the evenings, if necessary. With one exception, every senior department—boys and girls—in Hull sent a class or classes to the baths each week throughout the year. There were 1280 in the learners' swimming classes, and 2218 certificates were issued. Mr. Bates was allowed two months' leave of absence in order to study the work of the Playgrounds Association in Canada and the United States.

Warrington.

In all serious cases of measles in Warrington the parents are offered hospital treatment or the services of a district nurse. Children convalescent from infectious disease are seen by the school medical officer before returning to school, as are contacts with infectious disease suspects and children with sore-throats. The number of deaths among children of school age in the borough was the lowest recorded in the past ten years. The system whereby the nurses deal with cases of minor ailments in the schools has resulted in an extraordinary decrease in the numbers attending the clinic. In 1921 there was a total of 22,203 attendances, against 4150 in 1923. The children are attended to by the nurse twice a week in the schools. Dr. G. W. N. Joseph rightly regards the aim of all modern public health work as educational and designed to strengthen self-reliance. The danger of lessening parental or personal responsibility is borne in mind, and when the cases and the home are suitable they are referred for treatment in their own homes under the supervision of the nurses; 320 cases, most of them pediculosis capitis, were dealt with in this manner.

Margate.

Mr. Rowan McCombe considers that the children of to-day are better fed, better clothed, and cleaner than they were 10 or 14 years ago, although he doubts whether their parents are in any better circumstances. We wish he had been able to include "better housed." In spite of frequent visits to the schools of the school nurse and doctor, uncleanliness has been more prevalent during 1923, and Mr. McCombe deplores the fact that the authorities have no power to cut the hair of children in a verminous condition. The method of excluding unclean children from school and prosecuting the parent for non-attendance he considers clumsy and ineffective, and to use the powers given to the Education Authority under the 1908 Children Act would necessitate the employment of an extra nurse. About 80 per cent. of the parents attend medical inspection; this is encouraging and shows the interest being taken in the school medical officer's work in Margate.

Grimsby.

Here there is no scheme for dental treatment. Twenty-one per cent. of the children examined in the routine group had more than four decayed teeth, but on account of the lack of facilities for treatment only 9·6 per cent., the very worst cases, were referred for treatment. Altogether 4102 children were inspected in the code groups, and 22·08 per cent. required treatment; 12 mentally and physically defective children were reported to the authority during 1923. Apart from six children suffering from non-pulmonary tuberculosis who have been sent to sanatoriums, no provision has been made for cripples. Of nine children "suitable for training in a school or class for the totally blind," three are attending the ordinary elementary schools, and four coming under the same category are apparently receiving no instruction at all; two are in attendance at certified schools or classes for the blind. Special provision for defective children is urgently required here. Dr. B. C. Stevens reports more cases of malnutrition, but bad cases are the exception.

Cambridge.

Dr. A. J. Laird reports that the most notable features of the work for 1923 have been: (1) the steadily increasing use made of the clinics; (2) the greater readiness of parents to obtain treatment; (3) the elimination of ringworm as a serious cause of loss of attendance; (4) the maintenance of a high standard of cleanliness. The attendance at his clinic showed an increase of 611 children, 2523 children having been treated there. Dr. Mabel Gurney, the assistant medical officer, expresses the opinion that the slight reductions in the heights and weights indicate a falling off in the general physique of the children since the war, and attributes this to unemployment. According to the figures given, while there are fewer above the average, 8·7 per cent. against 15 per cent. in 1914, there are also fewer below, 4·3, as against 17 per cent. in 1914. Dr. Gurney comments on the insufficient amount of sleep some children get. Parents do not always realise the need to overcome the opposition every child makes to being sent to bed early. Among the older girls many demands are made upon their spare time by music lessons, Girl Guide and other meetings. Dr. Gurney has here laid her finger on an important point. It seems unfair that these activities, which are generally part and parcel of the school life at secondary or private schools, should only be available in the evenings for the elementary school child, who is often overburdened with home duties as well. It is impossible for elementary school-children to get to bed in time if they are intelligent enough to take an interest in activities outside school; such activities should be incorporated in ordinary school life. The number of children examined at dental inspections during the year was 4923. It was found that the percentage of children with four or more teeth decayed was 8 per cent. less than in 1922. Dr. Laird has gone very fully into the question of the prevention of dental decay. He has come to the conclusion that tooth-brush drill is impossible in schools owing to: (1) expense of outfit; (2) lack of suitable accommodation; (3) inutility, except from an educational point of view, and he suggests that instead tooth-brushes should be supplied to children at cost price. It is possible, however, that the educational value of tooth-brush drill alone is worth the time and money spent on it.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 28TH, 1924.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 65; scarlet fever, 1356; diphtheria, 692 (as against 651 of the previous week); enteric fever, 181 (as against 133 of the previous week); pneumonia, 677; puerperal fever, 46; cerebro-spinal fever, 11; acute poliomyelitis, 10; acute polio-encephalitis, 2; encephalitis lethargica, 132 (as against 161 of the previous week); ophthalmia neonatorum, 116. There were no cases of cholera, plague, or typhoid fever notified during the week. Of the 65 cases of small-pox, 24 were notified from the county of Derby (Derby 9, Chesterfield 12, Chesterfield R.D. 2); 2 from the county of Durham (Stockton-on-Tees); 9 from Middlesex (Willesden); 11 from Northumberland (Ashington); 2 from Nottingham (Hucknall); 13 from Yorks, North Riding (Middlesbrough 11, Eston 2). Of the cases of encephalitis lethargica, 26 were notified from the County of London (Camberwell 1, Finsbury 1, Fulham 2, Greenwich 1, Hackney 2, Hammersmith 1, Holborn 1, Islington 3, Lewisham 1, Paddington 1, St. Marylebone 3, St. Pancras 2, Shoreditch 2, Southwark 1, Stepney 3, and Woolwich 1); 6 from the county of Durham (Gateshead 3); 4 from Essex (Walthamstow 2); 5 from Bristol; 18 from Lancaster (Liverpool 7, Manchester 1); 8 from Middlesex (Tottenham 4); 2 from Norfolk (Norwich); 2 from Newcastle-on-Tyne; 13 from the county of Warwick (Birmingham 11); 12 from Yorks, West Riding (Leeds 3, Sheffield 3); and 2 from the city of York.

Deaths.—In the aggregate of great towns, the deaths from influenza numbered 30, while the deaths from diphtheria fell from 29 to 20.

THE Chelsea Hospital for Women has received from the Court of Common Council of the City of London £105 towards the fund (£20,000) being raised by the Lord Mayor for the completion of the Nurses' Home and opening of additional wards; £8300 are now required.

Correspondence.

"Audi alteram partem."

DISINFECTION IN SCARLET FEVER AND DIPHTHERIA.

To the Editor of THE LANCET.

SIR,—Dr. Duncan Forbes's paper in your last issue opens up again a field of discussion which is much wider than the transference of responsibility for disinfection from the local authority to the mother of the infected child, and for this reason, although with some hesitation, I submit the following observations.

Dr. Forbes does not suggest that the infectivity of scarlet fever or diphtheria is negligible. On the contrary, his pamphlet of 1909 gives very specific instructions to the housewife how to deal with infected articles. She, however, has her limitations; "books are difficult to disinfect" and they should be collected by "the Public Health Department." But just as some housewives would find it difficult to disinfect books, so many more (in some districts at least) would find it difficult to carry out the surgical spring-cleaning recommended, and in individual cases the decision would resolve itself into a question of expediency to be determined by the domestic facilities for carrying out the requirements.

In the argument, however, considerable importance is attached to the healthy carrier and the missed case in the spread of disease, and it is just precisely how far either is to be accepted as valid for all infections not otherwise explained that their use as a plea for reduced stringency in disinfecting measures becomes important. No one, indeed, questions the importance of either as a factor in spread, but will both together explain the recurring extensive waves of scarlet fever through several decades, or the rise in diphtheria, in Scotland at least, since the early years of the century?

Moreover, is a healthy carrier, even with his wider range of action, likely to be more effectual in transmitting disease than the clinically diseased person at close range? The argument would be valid had we evidence that these diseases spread by contact only. But contact alone will not explain even the autumnal rise in scarlet fever, still less its recurring extensive prevalence at intervals of years. And the increase in prevalence of diphtheria in Scotland took place after the healthy carrier had already established for himself a place in such inquiries. Both diseases illustrate, indeed, how very elementary is our knowledge of the life-history of the infecting organisms.

As a further illustration, in which the theory of the healthy carrier has also been advanced as an explanation of spread, take the present distribution of encephalitis lethargica in this country. What is the picture presented? A few cases are recognised widely separated from each other and with no discoverable association between them. Subsequently, in the neighbourhood of some, but not all of them, other cases occur, equally detached. It is rare that two cases occur in one family, but aggregations of cases within comparatively limited fields are not uncommon. Are we to ascribe this massing to healthy carriers in the district, when the clinically infected person almost uniformly fails to infect his own family? A spot map of such illustrations of endemic plague as we have experienced in this country would present just such features as I have tried to suggest of the distribution of encephalitis lethargica. Did we not know of the part played by the rat and its parasite, sporadic cases of plague would excellently illustrate the theory of the healthy carrier.

Our knowledge of some of the channels through which infection spreads is pitifully inadequate to explain the fluctuations in disease prevalences which occur, and it seems to me that until we have a wider knowledge of the life-history of infecting organisms, every step which would tend to suggest that infectivity was a comparatively trivial matter is to be taken in view of the whole problem and not of any particular aspect of it.

We dismiss the desquamating child from hospital because there would appear to be some evidence that certain stages of desquamation are not associated with infectivity. We find cases of scarlet fever grouping themselves round a particular class or department of a school and proceed to search for the desquamating child, often finding him without suggestive throat condition, and stop the occurrence of further cases by removing him. As facts of observation, these two illustrations appear to be contradictory, but they would undoubtedly find a common explanation did we know the life-history of the infecting organism. This has, I fear, travelled far beyond Dr. Forbes's suggestion of a comparative trial of domestic *v.* municipal disinfection, although it represents to me, at least, the mental attitude in which I think the question should be approached.

Finally, is it not worth asking what would be the effect on the mind of the housewife of proclaiming an infectivity which was to be combated by a restricted spring-cleaning?

I am, Sir, yours faithfully,

A. K. CHALMERS,
July 5th, 1924. Medical Officer of Health, Glasgow.

To the Editor of THE LANCET.

SIR,—Few readers will be inclined to disagree with the conclusions and practice explained by Dr. Duncan Forbes in his communication on the subject of disinfection, and one might almost feel confident in expressing the view that the practice which he indicates is that which is followed in a very large number of instances. The interesting volume published by Dr. C. V. Chapin, of Providence, U.S.A., in 1910, on the Sources and Methods of Infection is well worth perusal in connexion with Dr. Forbes's subject.

It will not be lost sight of, however, that in certain localities, for example, amongst the dockside labouring population of a large seaport which, in its habits and customs, differs widely from those of a fashionable health resort, the practice of disinfection goes far to encourage domestic cleanliness, and the processes which destroy vermin of various kinds are far from being without useful effect.

I am, Sir, yours faithfully,

E. W. HOPE,
July 7th, 1924. Medical Officer of Health, Liverpool.

"INDUCTION" OR "CAUSE" OF CANCER.

To the Editor of THE LANCET.

SIR,—Dr. A. Leitch (June 28th) is pleased to have his little jest about my lamb, but it is only kind to inform him that this is fast growing into a sturdy sheep, and will soon be strong enough to butt anyone who treats it disparagingly! This is not merely fond parental opinion; it is also the view of several biologists and pathologists fully competent to judge. The story of the photographic expert is highly amusing, but, unfortunately, it appears to me to be distinctly unapt, if meant to apply to my case. Had I ever ventured to discuss the clinical and macroscopic aspects of malignancy, the matter would be different. But observation of cases of cancer is not an indispensable requisite for the study of the behaviour of the cancer cells themselves. Dr. Leitch, as an eminent pathologist and bacteriologist, will know in how very many instances the actual cause of a disease can be determined in the laboratory without any visit to the bed-side being necessary.

As a matter of fact, my paper on malignancy (*Jour. R.A.M.C.*, vol. xli., October, 1923) was based in part on valuable sections most kindly lent me by Dr. Leitch himself; and what I have seen is there to be seen by others. It is all a question of being able *rightly to interpret what is happening!* I know quite well, of course, that microscopical study can only

furnish indications, not proof. But may I just add, in view of the trend of Dr. Leitch's remarks, that, while I would not in the slightest degree minimise the importance of the macroscopic study of malignant growths, I think the method of pondering the appearances shown by the cancerous cells, under a high power of the microscope—a study which seems to have almost gone out of vogue in these days—is one which can still give most helpful results. Particularly would this seem to me to be the case, if we remember that the malignant *condition* is the expression of some unusual manifestation of cell life—to which view, I take it, Dr. Leitch would subscribe. Has any other method of attacking the problem brought us anywhere near knowledge of the actual cause? Ought one, therefore, to neglect any line which may bring us nearer to the truth?

I am, Sir, yours faithfully,

London, June 30th, 1924. H. M. WOODCOCK.

SIMMINS APPEAL FUND.

To the Editor of THE LANCET.

SIR,—Under the above heading a remark occurs which might imply that the benefits derived from the Royal Medical Benevolent Fund are enjoyed by subscribers only, and that in this sense the fund is a provident institution. On the contrary, the annual report sets out the operation of the Fund in the following words: "The Fund is a general charity, the benefits of which are *open to all* deserving cases without restriction. Other medical charities are for the most part local, and of the nature of provident clubs, the benefits of which are restricted to subscribing members."—I am, Sir, yours faithfully,

CHARTERS J. SYMONDS,
Hon. Treasurer, R.M.B.F.

11, Chandos-street, Cavendish-square, W.,
June 30th, 1924.

SOME FUNDAMENTAL FACTORS IN THE SPREAD OF INFECTIOUS DISEASE.

To the Editor of THE LANCET.

SIR,—May I answer Dr. E. W. Goodall's kindly criticisms in THE LANCET of June 28th of my paper on the above subject. He quotes a paragraph which, he says, implies that "several infectious diseases, no matter what nature, could be nursed safely in the same ward." There was no intention of meaning this, and it was considered that the addition—"provided the beds are far enough apart"—enabled the statement to be generalised. Under the ordinary conditions of bed isolation treatment I accept unreservedly Dr. Goodall's amendment of the sentence—namely, "that it is possible so to nurse several different diseases." Bed isolation was introduced to illustrate a principle; I had no intention of discussing its practical limitations. I had read the discussions on bed isolation, which Dr. Goodall referred to, and found much in them to support the theories brought forward in my paper. I realise that in beds 9 or 12 feet apart certain cases, such as those suffering from chicken-pox, cannot safely be nursed in company with other patients. Dr. Goodall further thinks that I imply that "infection is to all intents and purposes always conveyed by heavy droplets at short range." The actual words used in the paper were: "The short-range jet of heavy droplets is the *usual* means by which so-called contact infection is acquired." Perhaps I should have added, "in many of those conditions in which the dependent organism is disseminated in buccal and respiratory discharges of the host." But I hoped the whole context suggested this limitation. The above proposition is not proved, but one of the objects of the paper was to indicate evidence in favour of it.

Dr. Goodall thinks that a term allowing for microbic multiplication should be introduced into the formula for velocity of infection. When either the resistance of the host or the infective intensity of the parasite increases or diminishes, a negative or positive acceleration of the velocity of infection will result, but the formula as it stands fulfils its purpose, which is to show as simply as possible how time can be a factor in acquiring parasitic infections. The use of round numbers was a clear method of explaining the principle of velocity of infection. It is unthinkable that anything so simple should actually happen, as that, of 100 microbes received, 50 are completely destroyed and 50 retain their infective intensity unchanged and that no multiplication occurs throughout the chosen unit of time. The original number of microbes may even increase; at the same time, their infective intensity may actually diminish under the action of the environmental conditions found in the host. This, however, is only guessing because what really happens is unknown.

I think Dr. Goodall overlooked my attempt to define virulence, which was as follows: "For the present purpose virulence may be defined as the extent to which a parasite can injure the host"—a purposely elastic definition which would have been improved by inserting "average susceptible" before host.

Perhaps an apology is due to Dr. Goodall and your readers for attempting to deal with so large a subject in so short a space. In the opening paragraphs of the paper I confessed I would have to be brief and dogmatic. The object of the paper was to indicate certain principles; there was no time to discuss their limitations in practice, or the application of them to special cases. I would like to add that most of the theories brought forward were, in the main, deduced from the experience gained during the 1918 influenza epidemic. In the case of diphtheria the Schick test enabled much more definite evidence to be collected in favour of the conclusions I arrived at from the study of other diseases.

I am, Sir, yours faithfully,

S. F. DUDLEY.

Royal Naval College, Greenwich, July 3rd, 1924.

THE FUTURE OF THE INDIAN MEDICAL SERVICE.

To the Editor of THE LANCET.

SIR,—I should be obliged by your permitting me to add a few remarks to the editorial note on the above-mentioned subject which appeared in THE LANCET of May 31st, 1924.

Some influential daily papers have been clamouring for an expeditious ratification of the recommendations contained in the Lee Commission's Report. The Commissioners themselves, probably prompted by the strained conditions they found during their comprehensive and invaluable investigation, also urged an early decision regarding their proposals. All who are familiar with the present position of affairs must be in full sympathy with a desire to arrive at a settlement of the many questions dealt with as soon as possible. Nevertheless, many will consider that this is a case in which wisdom lies in making haste slowly.

The report proposes the introduction of changes of grave importance in the All-India Services on the civil side, and particularly in the Superior Services of Provincial Governments. We are specially concerned with the proposed abrogation of the Indian Medical Service and the assistant surgeon branch of the Indian Medical Department, a change which common sense alone indicates should not be made without complete deliberation as to its immediate and ultimate effect on medical work in India.

I will not burden your readers with any opinion on the proposals contained in the Lee Commission's Report regarding the Medical Services, beyond stating that they provide for what should prove to be a perfectly organised and efficient military medical service in India if it includes the assistant surgeon branch of the Indian Medical Department (no adequate reason appears to be given for not including it), but the changes proposed for the Civil Medical Service are such as many experienced officers of the Civil

Services may consider will lead to stagnation, and possibly to rapid retrogression of Western medicine in India. The medical administration of the military side deals with approximately 300,000 men; the civil medical administration deals with a few hundred millions of people. Whilst undue haste is to be deprecated in dealing with the Lee Commission's Report, it is earnestly hoped that it will not share the fate of some of its predecessors, which became obsolete before any action was taken on them. Political opinion in India is shifting rapidly. Many serious questions hang on the decisions to be arrived at—recruitment, financial relief, leave, &c.—of the European services; the settlement of these should meet with no unnecessary delay.

The Lee Commission's Report will not be discussed in the Central Legislative Assembly in India until next September, and I understand that neither the Secretary of State for India nor the Government of India will take any action on the proposals until this discussion is over. It is highly probable that certain Indian politicians will attempt to withhold the grant of concessions to the European Civil Services until their demand of February last for further constitutional advance has been conceded.

I am, Sir, yours faithfully,

P. HEHIR,
Major-General, I.M.S. (ret.)

Westward Ho! July 5th, 1924.

SPINAL ANALGESIA.

To the Editor of THE LANCET.

SIR,—I was extremely interested in the article by Mr. B. H. Slater on spinal analgesia in THE LANCET of June 21st and your comments thereon. I think, however, that the views put forward are unduly optimistic. For instance, the general statement is made that "it is safer than general." While admitting that reliable statistics are extremely difficult to obtain, I doubt whether the most enthusiastic "spinal" advocate would claim a lower total mortality due to the method than 1 in 500. As a matter of fact, I know of several series of cases showing a considerable higher mortality. Turning now to general anæsthesia, the average immediate and remote mortality due to the anæsthesia (partly or entirely) ranges from 1 in 1500 to about 1 in 4000 in most London hospitals. Again, the statement is made that "there are no chest complications." I have myself seen four cases of serious chest complications following spinal analgesia, one of which was fatal. It is true that pulmonary complications are, on the average, less with spinal than with general anæsthesia, but is this not due to the fact that the former method is seldom used in operations involving much interference with the diaphragm and adjoining peritoneum—e.g., gastrectomy, cholecystectomy, splenectomy, &c.?

Mr. Slater also says that "there are practically no anæsthetic anxieties." I think that most anæsthetists will agree that spinal cases involve more worry than do "general" ones. Few situations are so unpleasant as to have a spinal patient with a progressively falling blood pressure in spite of an exaggerated "Trendelenburg" position. Complete muscular relaxation is also claimed as an advantage of spinal analgesia, but is by no means confined to this method. Endotracheal gas-oxygen with a surprisingly small amount of added ether provides the most complete relaxation that can be demanded, and does so with absolute certainty, owing to the perfectly clear airway which is at all times assured.

Finally, it is suggested that if the technique be correct, there are no disadvantages to spinal analgesia except some extra work. The following complications have all occurred, some of them fairly commonly: (1) Pulmonary troubles, including bronchitis, pneumonia, embolism, and acute pulmonary œdema. (2) Sudden cardiac failure during operation. Practically all cases show marked fall of blood pressure soon after the injection of the drug. (3) Alimentary complications. Vomiting is not uncommon during the operation and may prove embarrassing. Post-operative paresis of the gut and incontinence of fæces are rarer but more dangerous events. (4) Urinary complications. Loss of bladder control has occasionally led to ascending infection. (5) Various ocular paralyses leading to persistent strabismus, diplopia, and ptosis. (6) Persistent headache. One other indirect complication is reactionary hæmorrhage. Where the fall of blood pressure is marked, vessels may not bleed at the time of operation, but begin to leak when the patient is back in bed. Such a case proved nearly fatal quite recently.

It may be contended that these unfortunate events only occur when the technique is faulty. This, however, is not so, as the mortality has not been appreciably lowered by using "heavy" solutions or by employing the various substitutes for stovaine which are now on the market. I think that enough has been said to indicate that while spinal analgesia may be an admirable procedure for selected cases in skilled hands, yet it is by no means devoid of risk.

I am, Sir, yours faithfully,

C. LANGTON HEWER.

York-terrace, Regent's Park, July 4th, 1924.

THE WORK OF WELFARE CENTRES.

To the Editor of THE LANCET.

SIR,—Welfare centres have undoubtedly been of enormous value in reducing infant mortality, and of still greater value in raising the physical standard of the children, but I venture to suggest that more could be done if it were possible to standardise the advice given by doctors, midwives, and health visitors. All these are advising to the best of their ability, and the advice they give necessarily varies with their experience. Most of the work at an infant welfare is concerned with healthy infants, those that are really sick being taken usually to hospitals for treatment. The mothers of the healthy infants desire to know if what they are doing is the best for their babes. It is reasonable to suppose that the average infant of healthy parents is born healthy, and that subsequent minor ailments are due to lack of knowledge of the best way to feed, clothe, and house the infant on the part of the mother. Infants are like any other healthy young animals, and at any rate up to nine months could all be reared exactly alike without any distinction being made between them as regards diet and clothing.

As examples of the type of question asked by mothers, I select the following as illustrating the need of a standard.

1. What is the best time-table of infant feeding at birth? The answers vary from two-hourly during the day and twice at night, to five feeds a day at four-hourly intervals and none at night. On the latter time-table the infants thrive well and there is no question which is the more restful to the mother.

2. At what age should a healthy baby be weaned, and when should it be given such articles of diet as meat, potatoes, bread, and so on?

Here the variation in the advice given by individuals must be very great, so great, in fact, that the opinions of two doctors each running a welfare centre in the same town can be, and often are, diametrically opposed to each other, while midwives in the same centre each have their own opinions. These opinions are not concerned with the treatment of sickness about which there must be very often wide differences, but with the diet of a healthy child. I expect to be considered wrong in so advising, but I find that meat, chopped fine, is digested and well liked by many infants from nine months upwards.

There is, too, a great sum of money wasted annually in almost every household upon various medicines, particularly aperients. These latter are given for no reason whatever, more often than not with the mistaken idea of keeping a baby fit. If there should be a reason, what is required is some alteration in the diet rather than an aperient. They certainly do far more harm than good, when given indiscriminately,

and can quite reasonably be supposed to lower the physique, and make the infant more liable to piles later on in life. The ideal should be a normal action of the bowels without any medicine whatever, when if an aperient should be necessary for illness at any time its efficiency is so much greater. As an extreme instance, a mother informed me last winter that she was unable to afford any woollen garments for her children, but stated, with evident pride, that she was able to afford a 3*s.* 6*d.* bottle a week of some lung tonic to prevent them catching colds.

It is suggested that some competent body should issue a small cheap book stating exactly what is the ideal life time-table of a *healthy* infant, breast-fed and bottle-fed, with practical and economical advice *re* clothing, &c., from birth up to 2 years. I believe this would fill a much desired want on the part of mothers and welfare staffs and might obviate some of the defects of infant life which still permit a mortality of 69 per 1000 births.—I am, Sir, yours faithfully,

Southampton, July 6th, 1924. A. G. G. THOMPSON.

THE PROBABLE DUAL CONSTITUTION OF INSULIN.

To the Editor of THE LANCET.

SIR,—It has been assumed that since insulin administered by the mouth does not induce a fall in the sugar-content of the blood similar to that which results when it is given intravenously or hypodermically, it has no influence upon metabolism, and is either not absorbed by the mucous membrane of the alimentary tract or is destroyed by the digestive secretions. The metabolic experiments on animals upon which I have been engaged for some time in association with Mr. H. A. H. Howard, B.Sc., suggest that this conclusion is not entirely correct, for from observations on the respiratory quotient in a series of guinea-pigs and rats to which insulin had been given by the mouth it was found that, although there was no diminution in the blood-sugar, the effects of a subsequent injection of adrenalin were counteracted in much the same way as in animals to which insulin had been administered hypodermically. It would therefore seem that insulin may be absorbed through the walls of the alimentary tract, but that its properties are modified in the process, or, what is more probable, a fraction which promotes the utilisation of sugar by the tissues is destroyed, while another fraction which is able to neutralise the glycogenolytic effect of adrenalin passes into the circulation unchanged.

Six guinea-pigs, with an average fasting respiratory quotient of 0·73, gave an average respiratory quotient of 0·81, with the usual drop in the blood-sugar, after two units of insulin had been injected subcutaneously, and 0·81, with increases in the blood-sugar ranging between 0·14 and 0·18 per cent., after a hypodermic injection of 0·25 c.cm. of adrenalin. When insulin and adrenalin were injected in succession there was little or no change in the sugar-content of the blood or in the respiratory quotient if the doses were correctly adjusted, showing that the hypoglycæmic effect of the adrenalin had been neutralised by the insulin and that less carbohydrate was being utilised than when either was given separately. In the same series of animals the administration of two units of insulin by the mouth at hourly intervals for three hours was found to have no influence upon the sugar-content of the blood or upon the respiratory quotient, but when a hypodermic injection of 0·25 c.cm. of adrenalin was given 15 minutes subsequently the increase in the respiratory quotient, which should have developed if the adrenalin were acting unchecked, failed to appear, the average for the six animals working out at 0·735, or practically the normal fasting value. It was therefore evident that, although insulin given by the mouth had no effect upon the sugar-content of the blood, it was capable of preventing the glycogenolysis consequent upon the introduction of a potent dose of adrenalin into the circulation.

Similar results were obtained with white rats. The average respiratory quotient of three of these animals worked out at 0·77 in the fasting state. A hypodermic injection of two units of insulin produced a characteristic fall in the blood-sugar and a rise in the respiratory quotient to 0·82, while a hypodermic injection of 0·25 c.cm. of adrenalin was followed by an increase in the sugar-content of the blood and an average respiratory quotient of 0·82. Two units of insulin given by the mouth for three hours produced no alteration in either the percentage of sugar in the blood or in the respiratory quotient, and when 0·25 c.cm. of adrenalin was injected a quarter of an hour later there was still no change, an average respiratory quotient of 0·77 being obtained, demonstrating that in these animals, as in guinea-pigs, insulin administered by the mouth was capable of influencing carbohydrate metabolism, although only so far as its anti-glycogenolytic properties were concerned.

If, as these experiments indicate, the anti-glycogenolytic fraction of insulin taken by the mouth enters the circulation, while the sugar-utilising fraction is destroyed, or at any rate is not absorbed, it is possible to account for the beneficial effects claimed to have resulted in some cases of diabetes from the oral use of crude extracts of insulin, such as that of Mackenzie Wallis, and from the administration of raw pancreas, or preparations of the gland, by the mouth, for the anti-glycogenolytic portion being effective such treatment would be likely to be helpful where the hyperglycæmia was dependent upon defective storage of glycogen and there was no interference with sugar utilisation. It would, however, be of little or no value in cases in which there was defective utilisation as well as over-production of sugar, thus explaining the failure of oral treatment with pancreatic preparations where actual disease of the pancreas existed.

I am, Sir, yours faithfully,

July 4th, 1924. P. J. CAMMIDGE.

DEAFNESS IN SCHOOL-CHILDREN.

To the Editor of THE LANCET.

SIR,—May I, as one who has had some experience of the needs of the deaf child in elementary schools, be permitted to comment upon the report of Miss E. Lowry's paper in THE LANCET of July 5th (p. 20)? What I have to say may be best summed up under five heads.

1. There should be more adequate provision for removal of tonsils and adenoids, both at hospitals and in school treatment centres throughout the country, and the cases operated upon should be followed up.

2. These operations should be done by experts. In my experience many such operations are inadequately performed, and it is quite common for mothers to state that their children's deafness was "made worse" by the treatment. Moreover, it is by no means uncommon to find children who have been operated upon not twice, but three times. In many cases, also, the operation appears to have been the be-all and end-all, the deafness being left to get well by itself.

3. In school treatment centres, ear conditions should be treated by *specialists*. Harm has been done by classing ear troubles as "minor ailments," which they most distinctly are not. There is no dearth of competent young specialists to take charge of these centres.

4. Efforts should be made to deal with the child of pre-school age, with the definite view to preventing the conditions which lead to deafness.

5. More effort should be made to discover cases of early deafness in the schools. This, as I have pointed out repeatedly, could be done by introducing a whisper test during the vision-card test; or, as in France and Chicago, by means of games. I pointed this out in my "Plea for the Deaf Child" two and a half years ago (THE LANCET, 1922, i., 1027). These

tests are best done by the teacher, whom the children know and trust, rather than by the doctor, with whom they are apt to be shy. Children found wanting can be handed to the medical authority for more detailed examination. Deaf children could thus be discovered when treatment is of use and a large number of cases of deafness could thus be prevented. At present, these children go unrecognised, often until too late.

I may add that it is a matter of great gratification to me to find that the attention of otologists is becoming aroused to the necessity of prevention. I have been preaching it for the past 15 years, as has my friend Dr. Kerr Love in Scotland.

I am, Sir, yours faithfully,

MACLEOD YEARSLEY, F.R.C.S.

Wimpole-street, W., July 7th, 1924.

RESEARCHES ON LEPROSY AND THEIR BEARING ON THE TREATMENT OF TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—May I draw attention to a statement in Sir Leonard Rogers's lectures (THE LANCET, June 28th, p. 1297) in which he credits me with the statement that "the addition of 3 per cent. solutions of sodium gynocardate, morrhuate, or oleate to a pancreatic extract doubled the fat-splitting effect of the pancreatic lipase on an emulsion of olive oil." The accelerating action of sodium oleate on lipase varies considerably according to the percentage strength of the solutions used, and so far from using 3 per cent. strength solutions, 0·9 per cent. strength solutions were used in my experiments. My statement in the paper[1] referred to by Sir Leonard Rogers is "Systematic investigation of sodium oleate had previously shown that the accelerating action on extract of pancreas varies considerably according to the percentage strength of the solutions used; graduated amounts added to the extract show also a gradual rise in values up to a maximum, falling ultimately to nothing. I chose, therefore, a 0·9 per cent. solution of sodium oleate which had given good results formerly, and the same percentage solutions of sodium morrhuate and sodium gynocardate, using 1 and 2 c.cm. amounts of these solutions." Obviously the matter is of importance also in therapeutic dosage. He says further that these experiments in vitro led me to suggest a stimulating action of tissue lipolysis in part explanation of the therapeutic effect of sodium morrhuate and sodium gynocardate on acid-fast bacilli, and led him to investigate the possibility of these substances also stimulating the production of fat-splitting lipase in the blood of leprosy and tubercle cases, whereas, as a matter of fact, in my paper, after giving the actual results in my experiments in vitro, I went on to say that in view of the ascertained action of sodium oleate in vivo,[2] "it would seem reasonable to infer a direct stimulating action of tissue lipolysis in, at any rate, partial explanation of the therapeutic effect of sodium morrhuate and of sodium gynocardate, in addition to a direct destructive action claimed for both (Rogers) or for the chaulmoogrates alone (Walker and Sweeney) on acid-fast bacilli."

I am glad to see the confirmation of the lipase theory by Sir Leonard Rogers in the particular case of leprosy, which I have so long pointed out and maintained in cancer, tuberculosis, and other infectious diseases. I may, perhaps, be permitted to add that in 1912 I showed that in recovered tuberculosis the lipolytic activity of the serum is increased. Somewhat later it was found to be decreased in the acute stages, as well as (1914) in T.B. infected guinea-pigs and rabbits examined in the bacteriological laboratory, King's College. In my culture experiments also lipase killed tubercle bacilli.

I am, Sir, yours faithfully,

J. A. SHAW-MACKENZIE, M.D. Lond.

London, July 4th, 1924.

[1] Med. Press and Circ., August 18th, 1920.
[2] Proc. Physiol. Soc., Jour. Physiol., xlii., p. 11.

Obituary.

CHARLES HUNTER STEWART, D.Sc., M.B., C.M. EDIN.

BY the death of Dr. Charles Hunter Stewart, professor of public health and sanitary science and director of the John Usher Institute of Public Health, the University of Edinburgh has suffered another loss. Although he had been in poor health for some time, his death on June 30th at his residence in Melville-street, Edinburgh, came quite unexpectedly.

Prof. Stewart was born in Edinburgh in 1854, and educated at the University of his native city, while later he studied extensively on the continent. He first underwent training as a pharmaceutist, but, forsaking materia medica and chemical pharmacy, he applied himself with marked success to the study of experimental science and medicine, graduating Bachelor of Science in 1882, Bachelor of Medicine in 1884, and Doctor of Science in 1894. In 1880 he won the Hope Prize Scholarship in organic chemistry, and four years later the Mackay-Smith scholarship in chemistry. His early scientific training made him a keen observer and a most painstaking investigator. When in 1894 the University of Edinburgh decided to institute a public health laboratory in connexion with the chair of forensic medicine he was chosen by Sir Douglas Maclagan, then professor of medical jurisprudence, to organise and conduct the instruction in it. In 1898 he was appointed to the newly founded Bruce and John Usher Chair of Public Health, and he occupied that chair till his death. In 1902 he became also director of the Usher Institute of Public Health, to the planning and arranging of which he devoted a large amount of time and thought, the result being the provision of laboratories, which at that time were regarded as perhaps the finest in the country.

His colleague, Dr. J. Buchanan Young, writes: "In experiment Prof. Stewart was resourceful, and above all accurate, and he demanded the same accuracy in working from those whom he trained. As a young man he had worked hard, and he never failed to impress on his students the necessity for hard work if success was to be attained, and he took a keen interest in following the careers of those whom he had taught. His prolonged study in continental laboratories and his vast experience in laboratory work made him quick to appreciate improvements in processes and methods, but before any new methods were introduced into his courses of instruction they had to be thoroughly tested by himself as to accuracy of the results given. For many years he was well known and much sought after as an expert witness before the Scottish courts in river pollution cases, and in reference cases involving special knowledge of water-supply, &c. To the investigations connected with these he devoted a large amount of time and energy. The number of experiments he conducted, and the amount of labour and time he expended in satisfying himself as to the soundness of the views he expressed in evidence, were only known of by those who were associated with him in such work. His favourite reply when asked if it was absolutely necessary to make a certain experiment, which to the inquirer seemed somewhat troublesome, was 'Prove all things'! In later years he devoted himself largely to the epidemiological and statistical departments of public health. His grasp of figures was marvellous, and his memory for figures rather 'uncanny.' As a lecturer he was emphatic in style, interesting, and insistent on salient points. He had a quiet, somewhat 'pawky' humour, and those who met him in private life found in him a most interesting conversationalist, willing to discuss practically any subject. During 40 years as a teacher in the University (26 of these as professor of public health) he had seen many changes in the Edinburgh Medical School, and had taught a very large number of students. We who remain are all the poorer by his passing."

In 1888 Prof. Stewart married the eldest daughter of the late Mr. G. Gorden Gibson, an Edinburgh civil engineer. Mrs. Stewart died in 1905, and seven years later Prof. Stewart married a daughter of the late Mr. Robert Somers, of Thrushville, Stirling, who survives him, and to whom we offer our sincere sympathy.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdrs. H. J. Chater and R. W. G. Stewart to be Surg. Capts.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Comdr. W. E. Harker to be Surg. Capt.

Surg. Lt. Comdrs. J. B. Ronaldson and T. Turner to be Surg. Comdrs.

ROYAL ARMY MEDICAL CORPS.

The undermentioned Majs. and Bt. Lt.-Cols. to be Lt.-Cols.: D. S. Skelton, vice Lt.-Col. A. D. Jameson, to ret. pay; P. G. Easton, vice Lt.-Col. A. R. Greenwood, to ret. pay; and P. Davidson, vice Lt.-Col. and Bt. Col. F. McLennan, to ret. pay.

Maj. B. H. H. Spence is restd. to the estabt.

ARMY RESERVE OF OFFICERS.

2nd Lt. R. K. Wilson, late R.F.A., to be Lt.

MILITIA.

Capt. G. F. V. Leary to be Maj.

TERRITORIAL ARMY.

Capts. G. L. Malcolm-Smith (late R.A.M.C., S.R.), and D. S. Jones (late R.A.M.C.) to be Capts.; D. P. Levack and C. E. W. Bower to be Lts.

ROYAL AIR FORCE.

Squadron Leaders W. W. Shorten and F. N. B. Smartt to be Wing Comdrs.

Flight Lts. T. Montgomery and H. L. Burton to be Squadron Leaders.

Flight Lts. J. Craig and H. C. Perkins to be hon. Squadron Leaders.

Medical News.

UNIVERSITY OF OXFORD: *Radcliffe Scholarship in Pharmacology.*—The Master and Fellows of University College have awarded the Radcliffe Scholarship in Pharmacology in equal shares to Thomas C. Hunt, Magdalen College, and Alice D. K. Peters, St. Hugh's College, whose work was reported by the Professor of Pharmacology to be of equal merit.

Welsh Memorial Prize.—Dr. Lee's Professor of Anatomy has reported to the Vice-Chancellor that he has awarded the Welsh Memorial Prize for the best set of anatomical drawings in relation to human anatomy to Perer M. F. Bishop, Trinity College.

In the recent Examinations for the Degrees of Bachelor of Medicine and Bachelor of Surgery, the following candidates passed the undermentioned subjects of the Final Examination:—

Materia Medica and Pharmacology.—J. W. Alden, B. H. B. Bettington, M. D. Bower, G. Campbell, N. Chilton, J. H. Chitty, R. T. V. Clarke, P. F. Cluver, G. H. Crisp, D. M. Dunlop, J. A. Eyres, A. C. Gairdner, P. S. Hamilton, H. E. Harding, R. Illingworth, J. H. Kennedy, G. L. M. MacElligott, C. W. MacKenzie, R. G. Mathews, J. C. Neely, B. V. O'Connor, F. G. Parker, R. C. Probyn-Williams, W. F. H. Ray, D. I. Rees, W. G. Rees, A. Reid, D. A. Robertson, F. J. Sale, T. H. Sellors, G. P. Thorold, R. L. Graves, M. N. Jackson, C. I. Pattullo, and A. D. K. Peters.

Pathology.—G. R. P. Aldred-Brown, E. N. Allott, H. N. Bradbrooke, A. V. Clemmey, P. F. Cluver, L. O. F. Fysh, T. C. Hunt, R. Lewthwaite, P. C. Mallam, M. J. W. Minshull, P. Morton, W. D. B. Read, D. A. Robertson, G. P. Roxburgh, J. de la Mare Savage, T. H. Sellors, C. W. Simpson, and R. S. Wordsworth.

Forensic Medicine and Public Health.—J. W. Alden, M. M. Baird, L. J. Barford, R. J. Brocklehurst, C. W. Carter, H. N. K. Elphick, K. J. Franklin, C. J. Fuller, J. R. B. Hern, P. H. Martin, J. D. Mills, H. W. Pearson, A. A. F. Peel, D. I. Rees, A. W. L. Row, T. E. Ryves, J. G. S. Thomas, E. C. Whitehall-Cooke, and G. P. Wright.

Medicine, Surgery, Midwifery.—G. R. P. Aldred-Brown, W. B. Boone, W. H. Bradley, R. E. D. Cargill, C. W. Carter, T. H. Cathrall, J. L. Cox, C. L. Elgood, K. J. Franklin, A. T. Fripp, C. J. Fuller, D. R. Gawler, C. A. H. Green, E. H. Koerner, W. J. Lupton, H. W. Pearson, A. A. F. Peel, T. E. Ryves, I. M. Sidley, G. I. Wilson, and G. P. Wright.

UNIVERSITY OF DURHAM.—At the Convocation held on June 24th the following medical degrees were conferred:—

Doctor of Medicine.—Alan Angus, M.B., B.S., and Robert W. Locke, M.B., B.S.

Doctor of Medicine for Practitioners of 15 Years' Standing.—Henry H. R. Clarke, M.R.C.S., L.R.C.P.

Bachelor of Medicine and Bachelor of Surgery.—James R. Campbell, Oswald P. Chapman, Thomas L. J. Coxon, Ethel W. Daniels, Mary W. Dewell, George A. Gilmour, John C. Hall, Frances R. Henegan, M. Hopper, George E. Hyden, Ronald Keenlyside, Nora W. Kirk, John W. C. Leech, Thomas H. Meek, William Meikle, Thomas D. Miller, Guy Punshon, Margaret Ranken, James H. Saint, Margaret Scoresby-Jackson, Joseph A. Stobbs, Temperley Strother, Raymond L. Stubbs, and Edwin F. D. Walker.

Bachelor of Hygiene.—Margaret B. Herbst, M.B., B.S.

At the Convocation held on June 25th the following degrees were conferred:—

Doctor of Medicine.—Francis J. Benjamin, M.B., B.S., Roy N. Craig, M.B., B.S., Richard L. Dagger, M.B., B.S., William A. Jaques, M.B., B.S., and Thomas N. V. Potts, M.B., B.S., B.Hy., D.P.H.

Bachelor of Medicine and Bachelor of Surgery.—Thomas R. Aynsley, Elizabeth Bainbridge, William N. Booth, Joshua Carse, Stanislaus Curry, Archibald L. Fairlie, Thomas Fraser, James Henderson, Gordon C. Henry, John M. Johnson, Francis J. Lorriman, Kenneth V. Milburn, William C. Murray, John J. D. Naismith, Elsie L. Peet, John Reay, Matthew Ryle, Alfred Swindale, Geoffrey G. C. Taylor, and William A. Tweddle.

The following received the Diploma in Public Health (D.P.H.):—

Margaret B. Herbst, M.B., B.S.

The following received the Diploma in Psychiatry (D.Psy.):—

Reginald E. Illingworth, L.R.C.P. & S., L.F.P.S.G.

The following received the Licence in Dental Surgery (L.D.S.):—

George A. Catcheside, James F. Coltman, M.B., B.S., Lionel G. Dewar, Wilton L. Milburn, Arthur T. Picton, and Alexander S. Robertson.

UNIVERSITY OF SHEFFIELD.—As a result of the recent final examinations for the degree of M.B., Ch.B., the following candidates were successful:—

With Honours (Class II.).—George E. Larks (with distinction in Gynæcology), Charles A. Lister, and Aaron S. Mushlin.

Ordinary.—Amy D. Baker, William F. L. Castle, George S. Davidson, Edward M. Dearn, Phyllis H. C. Eardley, Donald A. Grattan, Cornelia H. Greaves, Harry N. Green (distinction in Medicine), Edith Hatherley, Harold Kelson, John E. King, William W. Mathews, Herbert Mercer, John O. Schofield, and Bertrand R. Wallis.

Reginald E. Pleasance passed the examination for the M.D.

UNIVERSITY OF DUBLIN, SCHOOL OF PHYSIC, TRINITY COLLEGE.—At examinations held recently the following were the successful candidates:—

FINAL MEDICAL EXAMINATION.

Part I., Materia Medica and Therapeutics; Medical Jurisprudence and Hygiene; Pathology and Bacteriology.—Robert L. Forsyth (passed on high marks), James E. McCauley, Ransome MacN. Allardyce, Annette K. Wood-Martin, Victor St. G. Vaughan, Richard G. Keays, Gilbert T. L. Archer, Barend P. Pienaar, Elspeth V. D. Hewat, Maiben A. W. Roberts, and Henry O. Clarke.

Part II., Medicine (M.B.).—Robert F. J. Henry (passed on high marks), Gordon Purdy, John K. S. Thompson, John L. Stuart, James S. Armstrong, John E. Beatty, Godfrey W. Garde, John R. Bradshaw, Edward Harvey, John Crawford, Charles J. du Plessis, John H. Bowyer, Leslie D. Dennard, Ralph A. Webner, Robert G. F. Thompson, Leslie M. Whitsitt, Gerrard A. Sloan, Alexander Hawthorne, Herbert W. Strong, Alfred J. Head, Lionel S. Levitt, and François J. Swanepoel.

Surgery (B.Ch.).—Gordon Purdy, John K. S. Thompson, Douglas L. Hemmingway, Maynard A. Gerrard, Robert E. Steen, Isidore Rosin, Desmond K. Lyons, John V. Morris, George A. Cowan, Alan J. Mooney, George Robinson, François J. Swanepoel, Carmichael Wilson, Leslie D. Dennard, Joseph Morris, John L. F. Steele, Otto G. Wilde, Eileen Brangan, Anthony B. Monks, Sylvia B. Wigoder, Gerrard A. Sloan, Simon Wigoder, Samuel McDermott, Mark J. Bradlaw, Samuel E. Magowen, Harry Ruben, Alexander L. Dobbyn, Kenneth F. Mackenize, Richard L. G. Proctor, John H. Bowyer, James S. Armstrong, William A. Hopkins, Maurice D. Fox, Lionel S. Levitt, John N. Atkinson.

Midwifery (B.A.O.).—Thos. W. MacDowell (passed on high marks), John V. Morris, William Gallaugher, Wentworth A. Taylor, Thomas C. Foster, Robert V. Franklin, Richard T. Cronin, Annie T. Deane, Mary C. Livingston, William C. G. Potts, François J. Marais, Edward A. Bennet, William G. Maule, John St. Clair, Patrick Wallace, Harry Waters, William A. Hopkins, Oliver Chance, Edward C. Dudgeon, Robert H. McKeag, Gideon J. Joubert, Gerard A. A. Powell, Eric T. S. Rudd, Charles L. Taylor, Francis V. Duke, Caleb P. Wallace, David N. Power, Thomas G. B. Crawford, Margaret O'Neil, William O. Warrington, Edward S. A. Crawford, George F. Gillespie, Leslie D. Dennard.

DIPLOMA IN PUBLIC HEALTH.

Part I., Chemistry, Bacteriology, Physics, and Meteorology.—Alice M. A. Downing, William E. Hutchinson, and Edward Parker.

Part II., Sanitary Engineering; Practical Sanitary Report; Hygiene and Epidemiology; Vital Statistics and Public Health Law.—Benjamin W. D. Fayle, William E. Hutchinson, Alice M.A. Downing, Robert S. McElroy, Alfred E. Campbell, Mary M. Galvin, Ruth Lemon, Ninian McI. Falkiner, and Iris P. Nelis.

DIPLOMA IN GYNÆCOLOGY AND OBSTETRICS.

Sylvia Gytha de Lancey Chapman.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—An extraordinary Comitia was held on July 3rd, Sir Humphry Rolleston, the President, occupying the chair. A report was received from the Treasurer on the Commemoration of the Tercentenary of the death of Thomas Sydenham at the Académie de Médecine de Paris, held on May 20th last. The quarterly report of the College Finance Committee was received and adopted. Prof. A. J. Hall was reappointed a representative of the College on the Court of Governors of the University of Sheffield.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—The annual meeting of the Fellows of the College was held at 10 A.M. on July 3rd for the election of three Fellows into the Council, in the vacancies caused by the retirement in rotation of Mr. W. E. Haslam, Mr. T. H. Openshaw, and Mr. Raymond Johnson. The President of the College, Sir John Bland-Sutton, was in the chair. The voting was carried out mainly by post, as has been the custom for many years, 1140 voting-papers being thus received from all parts of the world, while eight Fellows voted in person. There were 11 candidates for the three vacancies, and as the result of the ballot the President declared the following Fellows to be elected: William McAdam Eccles with 463 votes, Wilfred Trotter with 371 votes, and Sir Charles Gordon-Watson with 359 votes.

In the afternoon of the same day a reception was held by the President and the Council in the museum of the College, when the annual exhibitions of additions to the museum was opened for inspection between 4 and 6 P.M. Many specimens of surgical, pathological, and anthropological interest were on show, and of the additions to the museum some account was given in THE LANCET of last week (p. 28). The guests were received by the President and Lady Bland-Sutton, and for the first time in the history of the College, ladies were amongst those invited. Mr. H. J. Waring, Vice-President of the College, was also receiving; Sir Berkeley Moynihan, Vice-President, was unavoidably absent. The guests included all the members of the Council of the Royal College of Surgeons and ladies, Lord and Lady Riddell, Sir Rickman and Lady Godlee, Mr. and Mrs. Stanley Baldwin, Lord and Lady Aberconway, Sir Edward and Lady Boyle, Sir George and Lady Frampton, Lady Evans, Mr. and Mrs. Massey-Lyon, Colonel A. Sankey, and Mr. and Mrs. Gwynne. A programme of music was given by the Keith Prowse orchestra, and refreshments were served in the Inner Hall.

BEIT MEMORIAL FELLOWSHIP.—At a recent meeting of the trustees of the Beit Memorial Fellowship for Medical Research, Sir James K. Fowler, the hon. secretary, presented the annual report. The report stated that as far as the trust was concerned, the work of research had been carried on during the past year by one Senior Fellow, one fourth year Fellow, and 20 Junior Fellows, and the reports of the directors of the laboratories in which they were engaged indicated that in all cases their work had been satisfactory, and in many cases contained the statement that valuable additions to science might result from the researches upon which they were engaged. The Advisory Board have recommended that all the Junior Fellowships which do not now expire should be renewed for a further period of one year. Each year of late, Sir James Fowler said, as the number of candidates whom it was possible to exclude by a preliminary examination has diminished, the task of selection has become more difficult, and it can be stated that on this occasion every candidate gave evidence of being either actually engaged in scientific work or of capacity to undertake it. Eighty-six applications for forms and information were received in response to the advertisements announcing the election now to be held. Two of the Junior Fellows, Dr. Robert K. Cannan and Miss Ethel M. Luce, who had applied for an extension of their Fellowship to a fourth year, had withdrawn their applications owing to their appointment to Rockefeller Travelling Scholarships, as both Fellowships could not be held at the same time. This arrangement had the advantage of enabling such of the Beit Fellows as had shown exceptional capacity for research to obtain the great advantage of working for a time in laboratories in the United States, and did not prevent them from subsequently holding a Senior Fellowship on the Beit Foundation. Dr. Thomas Renton Elliott was appointed assistant hon. secretary. H. Davenport Kay, a Junior Fellow, was appointed to a Fourth Year Fellowship. The following are the names of the candidates elected to Junior Fellowships with an indication of the direction of research or proposed research. Alan Sterling Parkes, Ph.D., the physiology of reproduction. Henry Cohen, (1) continuation of work on composition of cerebrospinal fluid; (2) practical application of the "meningitis law."; (3) rate and cause of disappearance of glucose in the G.C.S.F. in meningitis; (4) effect of alterations in the chemistry of the blood or the permeability of the choroid plexus. Honor Bridget Fell, B.Sc., (1) experimental study of the nature of tumour growth. Margaret Averil Boas, B.Sc., action of anti-rachitic vitamin in diet and of light radiation in promoting retention of calcium and phosphorus. Henry Francis Holden, M.A., study of optically active substances, other than glucose, in normal and diabetic protein-free blood filtrates.

ROCKEFELLER MEDICAL FELLOWSHIPS. — The Medical Research Council announce that they have awarded Rockefeller Medical Fellowships, tenable in the United States of America during the academic year 1924–25, to the following: Robert Keith Cannan, M.Sc. Lond., Senior Assistant in Biochemistry, University College, London; John Josias Conybeare, D.M. Oxf., M.R.C.P. Lond., Assistant Physician and Warden of the College at Guy's Hospital, London; James Rögnvald Learmonth, M.B., Ch.B.Glasg., Assistant to the Professor of Surgery, Anderson College of Medicine, Glasgow; Ethel Marjory Luce, M.D. T.C. Dub., Lister Institute of Preventive Medicine, London; John William McNee, D.S.O., D.Sc., M.D.Glasg., M.R.C.P. Lond., Senior Assistant in the Medical Unit, University College Hospital, London; William Robson, B.Sc. Lond., Chemical Assistant in the Department of Therapeutics, University of Edinburgh.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—Owing to the illness of Dr. T. W. Naylor Barlow, the annual provincial meeting of this society will not be held at Wallasey on July 14th as arranged. A short business meeting to deal with matters on the agenda for the annual provincial meeting will be held at 2.30 P.M., on July 18th, at the University of Liverpool.

MEDICAL WOMEN'S INTERNATIONAL ASSOCIATION.—A meeting of this Association will be held in London from July 14th to 21st, at the invitation of the British Medical Women's Federation. On July 15th and 16th council and general meetings of the Association will be held, and on July 17th a discussion on Maternal Morbidity will take place. Various hospitals will be visited in London and Brighton. The social arrangements include a reception on the evening of July 16th at 10, Downing-street, by the Prime Minister, who, with other Members of Parliament, will also entertain members to tea at the House of Commons the following afternoon. A dinner, by invitation of the British Medical Women's Federation, will be held at the Trocadero Restaurant, London, W., on July 17th. Further particulars of the Congress can be obtained from the hon. secretary of the Hospitality Committee, Dr. K. F. Lander, 49, Albany-street, London, N.W. 1.

LONDON AMBULANCE SERVICE.—In a report presented to the London County Council by the Fire Brigade Committee, attention is drawn to a suggestion made in the recent report of the Ambulance Cases Disposal Committee, which was not included in the Committee's final recommendations. About 14 per cent. of the total number of cases dealt with by the ambulance service in the year 1922–23 were in respect of the removal of patients from one institution to another after the administration of emergency treatment. This arrangement involves the withdrawal of ambulances from the more pressing service of attending upon street accidents, and the Ambulance Committee suggested that a simpler and less costly type of ambulance might be used for this subsidiary purpose. The Fire Brigade Committee state that they have under consideration the practicability of this suggestion, although they hope that, if effect be given to the recommendations of the Ambulance Committee, the necessity for such transfers will be considerably lessened, if not entirely dispensed with. The London County Council this week passed a resolution to the effect that no institution which is not equipped for the reception and treatment of serious cases of accident or illness be retained on the list of institutions to which ambulance cases shall, in the first instance, be taken, that a list of such institutions be prepared, and that the coöperation of the Ministry of Health be sought in the case of infirmaries, and of King Edward's Hospital Fund in the case of hospitals. This resolution embodies the substance of two of the recommendations of the Ambulance Committee. The Fire Brigade Committee will settle the list.

LONDON HOSPITAL.—The prizes and certificates gained by students of the London Hospital Medical College and Dental School (University of London) were distributed on Monday, June 30th, by Sir Arthur Keith, in the Library of the College. Lieut.-Colonel W. Marlborough Pryor, chairman of the College Board, presided. Prof. William Wright, the Dean, in his report stated that although the years 1914–18 were years of great difficulty for the College, they could now confidently say that the difficulties had been surmounted and that the College was never in a more promising or indeed more flourishing condition than it was at present. Among the changes which had taken place in the College the most important was the discontinuance of the teaching of what were formerly the subjects of study during the first year of the medical curriculum—namely, elementary chemistry, physics, and biology. Their action in this respect had been recently followed by the General Medical Council, who had removed elementary chemistry and physics from the medical curriculum and made them the subjects of a pre-medical examination. The change had provided them with increased accommodation for the teaching of the purely medical subjects, while funds had been released for improving the teaching arrangements in connexion with, more particularly, the clinical subjects. The appointment of, in addition to the staff of the medical unit, no fewer than five surgical and four medical whole-time assistants, selected from the ablest of their younger men, was a new departure in the organisation of clinical teaching and should, with the unrivalled clinical facilities which existed at the London Hospital, ensure that in the spheres of clinical teaching and research they would more than maintain their already high position among the medical schools of the country. The trustees of the late Sir William Dunn had recently presented the hospital, at a cost of £8000, with a series of clinical laboratories, which would be officially opened in a few days. The Worshipful Company of Goldsmiths had given £15,000 for the endowment of the Goldsmiths' Chair of Bacteriology. The number of students in attendance compared favourably with that of former years. In the academic year now closing they stood, he believed, alone among the larger medical schools in London and throughout the country in being able to report an increased entry—an increase due largely to the entry of men from Oxford and Cambridge.

After presenting the prizes and certificates to the successful students Sir Arthur Keith said that to get a good reputation was the easiest thing in the world, and with that object everything they did must be unselfish. The unforgivable sin which would never be forgotten was that of selfishness, that of playing entirely for one's own hand. In aid of a good reputation came absolute honesty of purpose, speaking as near the truth as they could when the occasion called for it. They should not mislead their patients. No medical man was honest who was not familiar with what was happening in the best medical circles, in the way of discovery and advance in medicine. They could not be honest unless they continued to be medical students all through their lives. It was necessary for them to read constantly the medical papers. The particular kind of unselfishness which appealed to him more than any other was that which led men to devote their energies and their time to the discovery of fresh facts which made medicine a better-equipped tool in the hands of medical practitioners.

The following students were awarded prizes and certificates :—

Price University Scholarship in Anatomy and Physiology—£52 10*s.*: Mr. H. L. Green (University of Cambridge); £26 5*s.*: Mr. V. H. Brink, proxime accessit (University of Oxford). Clinical Medicine—£20 prize: Mr. E. V. Suckling; Honorary certificates: Mr. W. H. George, Mr. G. Milne, and Mr. G. King. Clinical Surgery—£20 prize: Mr. G. Milne; Honorary certificate: Mr. B. H. Wooderson. Clinical Obstetrics and Gynæcology—£20 prize: Miss M. I. Neal; Honorary certificate: Mr. R. W. Thomas. Andrew Clark Prize in Clinical Medicine and Pathology—Biennial—£26: Mr. G. King; Honorary certificate: Mr. H. G. Wyatt. Letheby prizes in—(*a*) Organic Chemistry—£15: Mr. A. M. A. Moore: (*b*) Chemical Pathology—£10: Mr. H. N. Bradbrooke: Honorary certificates in Anatomy and Physiology: Mr. D. H. Smith, Mr. F. H. N. Cruchley, and Mr. R. F. Ward. Dressers' prizes—(Elementary Clinical Surgery)—£5 prizes: Mr. F. L. White, Mr. F. W. Taboi², Mr. S. Levy Simpson, and Mr. H. L. Green. Honorary certificates: Mr. W. A. Taylor, Mr. R. K. Debenham, and Mr. R. J. Vince. (Minor Surgery)—£5 prizes: Mr. F. S. Duck, Mr. G. C. Dorling, Mr. D. R. W. Burbury and Mr. G. A. Coggin (divided), and Mr. A. M. A. Moore. Honorary certificates: Mr. F. H. N. Cruchley, Mr. H. A. Eason, Mr. E. N. Callum, Mr. W. D. Williams, and Mr. C. Wall. Practical Anatomy—£4 4*s.* prize: Mr. L. Cohen; £2 2*s.* prizes: Mr. W. D. Williams, Mr. A. F. Parker, and Mr. H. A. Eason. Anderson prizes in Elementary Clinical Medicine—£5 prizes: Miss C. M. Hext and Mr. H. N. Bradbrooke. Honorary certificates: Mr. S. Howard, Mr. W. E. Parry, Mr. P. Morton, Miss L. G. Apps, Mr. V. H. Brink, Mr. A. C. Gairdner, Mr. R. M. Bates, Mr. J. H. Ripka, Mr. E. W. Hayward, and Mr. D. G. Lloyd. Arnold Thompson Prize in Diseases of Children—£15 prize: Mr. G. King; Honorary certificate: Mr. W. A. Taylor. Harold Fink Prize in Operative Dental Surgery—£7 7*s.*: Mr. W. R. Booth and Mr. M. Sperber (divided). Honorary certificate: Mr. D. W. N. Squires. The London Prize in Dental Surgery and Pathology—£5 5*s.*: Mr. D. W. N. Squires. The London Prize in Dental Prosthetics—£5 5*s.*: Mr. O. N. Catchpole; Honorary certificate: Mr. I. Frankel. Class examination prizes (each of the value of £3 3*s.*)—Dental Surgery and Pathology: Mr. J. L. Gordon; Honorary certificate: Mr. B. J. Swyer. Dental Prosthetics: Mr. O. N. Catchpole; Honorary certificates: Mr. H. W. Duchesne, Mr. J. E. M. Hennessey, Mr. J. N. Noriskin, Mr. A. Schultz, Mr. A. Silva-Jones, and Mr. A. Bendelstein. Dental Metallurgy: Mr. J. W. Gilbert. Dental Histology (Normal): Mr. H. Middleburgh; Honorary certificate: Mr. G. R. Mears. Dental Anatomy: Mr. H. Middleburgh.

SOCIETY OF APOTHECARIES OF LONDON. — On July 8th a dinner was given by the Society (in their hall) to representatives of the medical profession from the Dominions. The guests were received by the Master, Dr. Thomas Wakefield, and the Wardens, Dr. A. D. Brenchley and Dr. T. V. Dickinson. In proposing the toast of "Our Guests," Dr. Wakefield gave an interesting sketch of the history of the Society of Apothecaries from its foundation in the reign of James I. He compared the growth of the colonies at different periods of the Society's life, and said that he regarded this evening as one of the most important events in its whole history. Lieut.-Colonel Grant, I.M.S., replied for India and referred to the work of Sir Ronald Ross and Sir Leonard Rogers; Dr. T. J. Costello responded eloquently on behalf of Canada. Dr. T. Taylor Downie, speaking for Australia, said that their greatest drawback in that continent was lack of population, and referred to it as a land of splendid endeavour. For New Zealand Dr. Arnold Izard spoke, and for South Africa Dr. H. Temple Mursell. Newfoundland was represented by Dr. T. W. Grenfell, who said that he ought really to represent Labrador, and gave a vivid account of life and work in that country. Other speakers were Sir Bruce Bruce-Porter, vice-chairman of the Dominions Hospitality Committee, Dr. Gordon Brown, senior Past Master of the Society, Sir Ronald Ross, and Dr. A. L. Hoops. Among the guests were Sir William Hale-White, Dr. Herbert Spencer, Sir W. J. Collins, Mr. A. Mortimer Woolf, Mr. E. T. C. Milligan, Sir George Buchanan, Dr. A. J. S. Brandon, Dr. F. W. B. Greaves, Colonel E. C. Freeman, Dr. J. J. Holland, Dr. E. Fyffe, and Dr. W. F. Burfitt. At the conclusion of the evening an illustrated booklet descriptive of the Society's hall and of the "Art and Mistery" of the apothecaries was presented to each guest.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Tuesday, July 15th.

SPECIAL GENERAL MEETING OF FELLOWS: at 5 P.M., to be immediately followed by a
GENERAL MEETING OF FELLOWS:
Ballot for election to the Fellowship.

LONDON DERMATOLOGICAL SOCIETY.

WEDNESDAY, July 16th.—4.30 P.M., Annual General Meeting at St. John's Hospital, Leicester-square. Clinical Cases and Pathological Specimens will be shown. The Monthly Dinner of Fellows will not take place on this occasion.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY, July 14th.—11 A.M., Surgical Registrar: Surgical Wards. 2 P.M., Mr. Simson: Diseases of Women. 2 P.M., Mr. Bishop Harman: Eye Dept.

TUESDAY.—10 A.M., Dr. Drummond Robinson: Gynæcological Operations. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-patients.

WEDNESDAY.—11 A.M., Medical Registrar: Medical Wards. 12.15 P.M., Dr. Burnford: Medical Pathology. 2 P.M., Dr. Owen: Medical Out-patients.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 12 noon, Medical Registrar: Clinical Methods. 2 P.M., Mr. MacDonald: Genito-Urinary Dept.

FRIDAY.—12 noon, Surgical Registrar: Surgical Pathology. 2 P.M., Dr. Burrell: Medical Out-patients. 2 P.M., Mr. Viasto: Throat, Nose, and Ear Dept.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.

Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.

THURSDAY, July 17th.—5 P.M., Mr. Richard Lake: Otosclerosis. (Geoffrey E. Duveen Lectures in Otology.)

HOSPITAL FOR SICK CHILDREN, Gt. Ormond-street, W.C.

THURSDAY, July 17th.—4 P.M., Dr. Pearson: Pyrexia of Obscure Origin.

Parliamentary Intelligence.

HOUSE OF LORDS.

TUESDAY, JULY 8TH.

Liquor (Popular Control) Bill.

THE debate was concluded on Lord Banbury's motion for the rejection of the Bishop of Oxford's Liquor (Popular Control) Bill.

The motion for rejection was carried by 166 votes to 50, majority 116.

HOUSE OF COMMONS.

WEDNESDAY, JULY 2ND.

Legacies to Hospitals.

THE Finance Bill was considered in Committee, Mr. YOUNG, Chairman of Committees, in the chair.

Viscount EDNAM moved a new clause to provide that legacy and succession duty should not be leviable on testamentary bequests made to hospitals carried on in the public interest. He said that the dividends on bequests and legacies were the only regular source of income on which the hospitals could rely. The cost of the concession, it was calculated, would be between £80,000 and £130,000 a year.

Lieut.-Colonel FREMANTLE said that hospitals were an absolute necessity of modern civilisation, and if charitable efforts were to fail there was not the least question that there would be an overwhelming demand that the hospitals should be maintained and extended out of the rates and taxes.

Sir C. BARRIE, speaking as the past chairman of one of the largest hospitals in Scotland, supported the appeal, and said that it would be lamentable if the country were to allow its hospitals to be put on the rates or kept up by money provided by the State.

Mr. SNOWDEN, Chancellor of the Exchequer, said that if they were discussing this question as a sentimental matter they would be all agreed; but they must not allow their sentiments to blind them to reasonable arguments. This proposal really amounted to a State subsidy to the voluntary hospitals and the money would be handed over without any control as to the spending of it. Moreover, if the concession were granted, the case would be irresistible for its extension to other charities. He was not going to say that it was inadvisable that the State should make a contribution to the voluntary hospitals, but if that were done this was not a desirable way of doing it. If legacies to hospitals were freed from duty he did not think that the hospitals would gain very much and the State would lose about £200,000 a year. He was therefore compelled to resist the amendment.

On a division the proposed new clause was negatived by 251 votes to 148, majority against 103.

Ratio of Births and Deaths in Great Britain.

Mr. BLACK asked the Minister of Health whether he would state the extreme variations of the rates of births and deaths in the various localities in Great Britain, and also the average rate of births and deaths for the whole country during the past year.—Mr. WHEATLEY replied: In England and Wales during 1923 the birth- and death-rates per 1000 population ranged in various types of administrative area, are as follows:—

	Births from—	Deaths from—
Urban areas—		
50,000 population and over ..	13·0 to 27·5 ..	9·0 to 16·3
20,000 to 50,000 population ..	11·0 to 31·4 ..	7·2 to 16·5
Under 20,000 (ignoring populations of less than 1000) . ..	7·2 to 35·4 ..	4·8 to 20·5
Rural areas—		
Ignoring populations of less than 1000	9·8 to 34·7 ..	7·0 to 19·7

The average rates for England and Wales are: Births, 19·7; deaths, 11·6. As regards the figures for Scotland, the hon. Member will no doubt address a question to the Secretary for Scotland.

Officers' Disability Retired Pay.

Sir BERTRAM FALLE asked the Parliamentary Secretary to the Admiralty whether he was aware that disabled officers who retired under the special terms laid down in A.F.O. 1358/1922 were not considered by the Ministry of Pensions to be eligible for disablement pensions, on the ground that they had received special treatment by the Admiralty; and whether the 5½ per cent. reduction in retired pay would be applicable to these officers.—Mr. HODGES replied: I am aware that the Ministry of Pensions does not regard officers retired upon the special terms granted in 1922 for the purpose of clearing the lists as eligible for disability retired pay under its regulations. As regards the second part of the question, the special rates of retired pay sanctioned in 1922 are subject to the 5½ per cent. reduction except in certain cases of young officers who were given the right to commute the whole of their retired pay.

Final Awards of Ex-Service Men.

Mr. WILLIAM ALBERT JENKINS asked the Minister of Pensions if he was aware that certain concessions had recently been made with regard to the final awards of ex-Service men; and, as a large number of ex-Service men were, on account of technicalities, experiencing much difficulty in getting their cases properly inquired into and were suffering injustice, would he take steps to repeal the Final Awards Act.—Mr. J. W. MUIR (Parliamentary Secretary to the Ministry of Pensions) replied: General instructions providing for an improved procedure for the correction of awards which are found to have been erroneously declared final have only been issued within the last few weeks, and further experience is, in the opinion of my right hon. friend, necessary before it can be determined that any modification of them is required.

Uniform Standard of Health Services.

Mr. BLACK asked the Minister of Health whether he would set up a committee to inquire into the necessity for, and the advantages of establishing, a minimum standard in the administration of all health services included in his Ministry in order to secure that the health interests of the public should be conserved in areas where the local authorities might not be progressive; and whether he would include expert medical officers of health upon such a committee.—Mr. WHEATLEY replied: As at present advised, I do not think the appointment of such a committee would be of advantage.

Royal Commission on Lunacy.

Mr. COSTELLO asked the Minister of Health if he would say whether the terms of reference to the Royal Commission on Lunacy included an inquiry into the conditions which obtain in mental institutions of every kind and the present régime to which the inmates were subject; and whether provision would be made for defraying the expenses incurred by witnesses in coming and staying in London to attend the sittings of the Commission.—Mr. WHEATLEY replied: The terms of reference of the Royal Commission include an inquiry into the certification, detention, and care of persons under the Lunacy Acts whether in public or private institutions or in single care. Witnesses summoned by the Commission to give evidence before them in London will be repaid their expenses in accordance with the scale prescribed by the Treasury.

Poplar Report on Food Adulteration.

Mr. LINFIELD asked the Minister of Health whether his attention had been called to the report on food adulteration by Mr. A. E. Parkes, the borough analyst for Poplar; and whether he could hasten the report of the Government Committee so that early action might be taken.—Mr. WHEATLEY replied: Yes, Sir, my attention has been called to the Poplar borough analyst's report. I understand that the Committee hope to present their report in the near future.

Overcrowding in Shoreditch.

Mr. THURTLE asked the Minister of Health whether he was aware of the fact that there were dwelling-houses in Essex-street, Shoreditch, in which the average number of occupants per room exceeded five; and if, in view of the moral and social consequences of such overcrowding, he was prepared to take power to acquire some of the large number of empty houses in the Sloane-square neighbourhood in order to provide better accommodation for the people.—Mr. WHEATLEY replied: I am aware of the overcrowded conditions in Central London. Local authorities have power to acquire and adapt large empty houses, but experience has shown that this is not usually the most economical means of providing fresh accommodation. I am satisfied that the best remedy for overcrowding is the building of new houses.

Housing Bill and Larger Houses.

Mr. TREVELYAN THOMSON asked the Minister of Health if he was aware that since the introduction of his Housing Bill the representatives of over 300 local authorities, representing the chief cities and towns in the country, assembled in conferences at Newcastle-on-Tyne, Manchester, Sheffield, London, Bristol, and Cardiff, had in all cases unanimously passed resolutions protesting against the subsidy being limited to the small type of houses named in his Bill; and, in view of this unanimous feeling in favour of a larger house, would he take powers which would enable him to grant the subsidy to houses of an additional 100 superficial feet on the recommendation of the local authorities concerned.—Mr. WHEATLEY replied: I cannot accept the suggestion that local authorities are unanimously in favour of an extension of the subsidy to larger houses, and I do not propose to ask the House to review the decision which it has already taken in regard to the size of the houses.

Expenditure on Vaccination.

Mr. BLACK asked the Minister of Health whether he could supply details of the expenditure on vaccination for the year 1921–22, stated to amount to £172,558; and how many infants were actually vaccinated for this sum, and what the cost per infant vaccinated had been.—Mr. WHEATLEY replied: The sum of £172,558 included £10,158 paid to public vaccinators out of the Exchequer contribution accounts of the local authorities and £162,400 expended by boards of guardians out of the rates, but I am unable to supply any further details. The number of infants vaccinated by public vaccinators during the year ended Sept. 30th, 1922, was 205,106. It is not possible to state the cost per infant vaccinated, as the expenditure on public vaccination includes also the cost of other vaccinations and revaccinations, and the necessary administrative expenditure under the Vaccination Acts.

Child Assault in Scotland.

The DUCHESS of ATHOLL asked the Secretary for Scotland whether, in view of the numerous serious cases of child assault occurring in Scotland, he would set up a committee of inquiry to inquire into the extent of this evil and to suggest how it might be remedied.—Mr. STEWART (Under-Secretary for Health for Scotland) replied: My right hon. friend is not satisfied that the circumstances in Scotland are such as to justify the expectation that an inquiry of the nature indicated in the question would serve a useful purpose. If, however, the noble lady will favour him with a statement of the grounds on which her suggestion is based, he is prepared to give the matter further consideration.

THURSDAY, JULY 3RD.

Tuberculous Persons in Sanatoriums.

Mr. ROBERT MORRISON asked the Minister of Health whether he has any information as to the number of tuberculous persons at present in sanatoriums and the number awaiting admission.—Mr. WHEATLEY replied: The number of persons receiving treatment in residential institutions under the tuberculosis schemes of local authorities in England and Wales on June 1st last was 18,245 and the number of persons recommended for and awaiting such treatment on that date was 4150. I am hopeful that the circular issued by my department in February last promising grants in aid of approved proposals for the development of the health services will result in a substantial addition to the available accommodation for the treatment of this disease.

Criminal Statistics for 1922.

Mrs. WINTRINGHAM asked the Home Secretary if he would give information as to the date when the publication of the criminal statistics for 1922 might be expected in view of the lapse of time since the report for 1921 was issued; and whether copies of the criminal statistics would be circulated officially to all benches of magistrates in addition to the circulation of official copies to all police authorities.—Mr. HENDERSON replied: It is hoped that the volume will be issued early next month. Copies are supplied officially to all superior criminal courts, including recorders and chairmen of quarter sessions, but I am afraid it is not possible to make a free issue to all benches of magistrates.

TUESDAY, JULY 8TH.

Notified Diseases.

In reply to a question how many cases of the following diseases have been notified this year—small-pox, diphtheria, scarlet fever, pneumonia, enteric fever, encephalitis lethargica, Mr. WHEATLEY (Minister of Health) replied: The numbers of cases of these diseases notified (uncorrected figures) during the 26 weeks ended June 28th, 1924, are as follows: Small-pox, 2196; diphtheria, 18,095; scarlet fever, 36,910; pneumonia, 41,321; enteric fever, 1683; encephalitis lethargica, 3620.

Sickness Benefit Delays.

Mr. SAMUEL ROBERTS asked the Minister of Health whether he was aware of complaints arising from delay in payment of sickness benefit under the National Health Insurance Act to sick insured persons; and, if so, whether he would appoint a departmental committee to inquire into the matter.—Mr. GREENWOOD (Parliamentary Secretary to the Minister of Health) replied: My right hon. friend is aware that complaints are occasionally made of delay in the payment of benefit to which insured persons are entitled. The subject has been and is being dealt with departmentally and he does not think it necessary to appoint a departmental committee, particularly in view of the appointment of a Royal Commission to review the whole system of national health insurance.

Free Use of Public Baths.

Mr. AYLES asked the Minister of Health whether, in view of the serious difficulty arising out of the overcrowding of the people in the large towns, he could see his way to advise local authorities that if in their opinion it was necessary to public health for unemployed persons and their dependents to have the free use of the public baths in their areas, he was prepared favourably to consider grants in aid for that purpose.—Mr. GREENWOOD replied: My right hon. friend regrets that he has no funds available for this purpose.

Coöperation in Town Planning.

Mr. AYLES asked the Minister of Health how many areas had passed the necessary resolutions preliminary to making town plans for their area; and whether he would see that the closest coöperation was advised between town planning, housing, and sanitary and improvement committees in order to avoid conflicting policies and overlapping in the alteration of developed areas and the layout of new ones.—Mr. GREENWOOD replied: Resolutions have been passed by 229 local authorities. My department are constantly emphasising the importance of the closest coöperation not only between different committees of the local authority but also with outside interests.

Inquiry into Final Awards.

Lord HENRY CAVENDISH-BENTINCK asked the Minister of Pensions if he had received a resolution from the Nottingham and district war pensions committee, in which they urged him to review the whole system of final awards, on the grounds that the present system involved undue hardship and even injustice in many cases; and whether, in view of the number of unsuccessful appeals and the dissatisfaction existing among the appellants at their treatment, he would cause the whole system to be inquired into.—Mr. J. W. MUIR replied: My right hon. friend has not yet received the resolution referred to. I may, however, remind the noble lord that my right hon. friend has, as indicated in his reply to the hon. and gallant Member for East Rhondda on March 27th last, put in operation arrangements which will enable cases in which an award is found to have been erroneously declared final to be amended.

Medical Examination and Home Treatment.

Mr. GROVES asked the Minister of Pensions whether he had considered the effect upon ex-Service men of Circular M.P.A.O. 15A, home treatment, which in cases where, as a result of medical examination by the Ministry doctors, treatment by a general practitioner was necessary, advised consultation with the national health insurance doctor on whose panel the man was listed, but also stated that the man would not be prevented from working at a remunerative occupation in consequence of and during treatment allowance therefore not being payable; whether he was aware of the cases where the panel doctors thus concerned, after careful examination, had issued certificates definitely stating that they found the man incapable of work, but the Ministry of Pensions had refused to honour such certificate; and whether, when such decision was given for disabilities which the Ministry agreed as being due to or aggravated by war service, he would give instructions to local area offices that certificates granted by the national health insurance doctor, to whom the man was specially referred, were acceptable and full treatment allowances be granted for the periods of incapacity covered.—Mr. J. W. MUIR replied: The conditions governing the grant of allowances under Article 6 of the warrant are not identical with those which determine certification for the purpose of sickness benefit under the National Health Insurance Acts. My right hon. friend regrets, therefore, that he is unable to adopt the suggestion in the last part of the question. At the same time, the circular letter referred to does not appear to my right hon. friend to be altogether satisfactory, and it will be reconsidered.

MEAT INSPECTION IN SCOTLAND.—The Scottish Board of Health have issued to all local authorities in Scotland revised regulations, which come into force on August 1st, dealing with the inspection of meat and kindred matters. The object of the regulations is to protect consumers from diseased or unsound meat. In a covering circular the Board explain that the new regulations (the official title of which is "The Public Health (Meat) Regulations (Scotland), 1924") cover practically the same scope as the Meat Inspection Regulations issued in April, 1923, with some adjustments designed to improve the machinery of administration and with some additions. Among the matters the machinery for dealing with which has been adjusted are the inspection of the carcasses of animals slaughtered because of accident or for other emergency reasons, and the hawking of meat and meat-food products from carts or other vehicles or from barrows, baskets, booths or stances, and among the new provisions is one prohibiting the hanging of carcasses intended for purposes of food in stables and similar places, the carrying on of a butcher's business in premises used as living accommodation, and the storing of meat intended for sale in living and sleeping rooms. Copies of the regulations can be obtained from H.M. Stationery Office, 120, George-st., Edinburgh, price 4*d*.

Appointments.

BROWN, L. G., M.D., B.Ch. Oxf., F.R.C.S. Eng., has been appointed Assistant Surgeon to the Ear, Nose, and Throat Department of Charing Cross Hospital.

GILCHRIST, J., M.D. Edin., one of the Medical Referees under the Workmen's Compensation Act for the county of Lanark.

M'KIE, W., M.B., Ch.B. Edin., Senior Resident Medical Officer at King's Cross Hospital, Dundee.

Certifying Surgeons under the Factory and Workshop Acts: VERITY, R. J. S., L.M.S.S.A. (Abersychan, Monmouth); WALKER, J. B., L.R.C.P. & S. Edin. (Ayr).

Vacancies.

For further information refer to the advertisement columns.

Bath, Royal Mineral Water Hospital.—S.

Birmingham, Rubery Hill and Hollymoor Mental Hospital, Northfield.—Asst. M.O. £350.

Brighton, New Sussex Hospital.—Hon. Asst. Anæsth.

Chesterfield and North Derbyshire Royal Hospital.—R.S.O. £300.

Delhi, Lady Hardinge Medical College.—Lecturer in Physiology. Rs.750 p.m.

East Ham County Borough.—Temp. Asst. M.O.H. £500.

Gloucestershire Royal Infirmary, Gloucester.—P.

Hampstead General Hospital.—Gynæcologist.

Hong-Kong University, Faculty of Medicine.—Professor of Obstetrics and Gynæcology. £800.

Hospital for Consumption, &c., Brompton.—R.M.O. £500.

Hull City Mental Hospital.—Sen. Asst. M.O., &c. £600.

Hull Royal Infirmary.—Asst. House Phys. £130.

Isle of Wight County Mental Hospital.—A.M.O. £300.

King's Lynn, West Norfolk Hospital.—Res. Surg. O. £300–£350.

Kingston Union.—Second A.R.M.O. £300.

Larbert, Stirling District Mental Hospital.—Pathologist. £600.

Leeds Public Dispensary.—Sen. Res. M.O. £200.

Liverpool City.—M.O.H. £1800.

London Hospital.—Asst. Phys. Also Second Reg. to Ear, Nose, and Throat Dept.

Lymington, Hants, Borough.—M.O.H. £70.

Manchester Royal Eye Hospital.—Jun. H.S. £120.

Manchester Royal Infirmary.—H.S. £50.

Margate, Royal Sea Bathing Hospital.—H.S. £200.

Metropolitan Hospital, Kingsland-road, E.—Asst. Dent. S.

Norwich, Norfolk and Norwich Hospital.—Anæsth. £300.

Oldham County Borough—Asst. M.O.H. £450.

Queen's Hospital for Children, Hackney, E.—Asst. Cas. H.S. £100.

Royal Chest Hospital, City-road, E.C.—P. to Out-patients.

Royal Free Hospital, Gray's Inn-road, W.C.—H.P. and H.S.

Seamen's Hospital Society.—Surgeon.

Sheffield Royal Infirmary.—Med. Reg. £400. Also Ophthalmic H.S. £60.

Sutton, Sutton Downs Hospital for Children.—Jun. Asst. M.O. £500.

University College Hospital, Gower-street, W.C.—Tub. O. £300. Also Non.-Res. House Anæsth. £100.

Ventnor, Royal National Hospital for Consumption, &c.—Sen. Res. M.O. £300.

West London Hospital, Hammersmith-road, W.—Asst. Anæsth.

The Chief Inspector of Factories, Home Office, London, S.W., announces a vacant appointment at Hertford, Herts.

Births, Marriages, and Deaths.

BIRTHS.

DAVIES.—On July 4th, at "Plas-Darland," Wrexham, the wife of John E. H. Davies, D.S.O., M.R.C.S., L.R.C.P., of a son.

VAILE.—On July 2nd, at Albert-mansions, Northumberland-street, W., the wife of Dr. T. B. Vaile, of a son.

MARRIAGES.

FARDON—KIRKLAND.—On June 28th, at St. Mark's, Reigate, Harold Joseph Fardon, M.D., to Kathleen Nina, elder daughter of the late Arthur Kirkland, and of Mrs. Kirkland, of South Park, Reigate.

ROSS—TOWNSEND.—On July 5th, at St. Bartholomew-the-Great, London, James Paterson Ross, F.R.C.S., to Marjorie Burton, younger daughter of Captain F. W. Townsend Botley, Hants.

DEATHS.

ELLIOTT.—On July 4th, at Sonning-on-Thames, Edgar Elliott, M.R.C.S., L.R.C.P., late of Sevenoaks, in his 68th year.

NALL.—On June 29th, suddenly, at Furness Vale, Samuel Nall, B.A., M.B., D.P.H., M.R.C.S. Eng. (Camb. and St. Bart.), the beloved husband of Lizzie Nall, aged 69. For many years in practice at Disley.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE PART PLAYED BY TRAINING COLONIES IN THE TREATMENT OF TUBERCULOSIS.*

BY F. N. KAY MENZIES, M.D. EDIN., F.R.C.P. EDIN., D.P.H.

THE first reference I can find to the "colony" is a plea by Sir Robert Philip, founded on the experience of the Royal Victoria Hospital, Edinburgh, for the establishment of farm colonies for tuberculous patients. The experience of that sanatorium showed (*a*) that in a number of cases complete arrest of disease could not be attained within the ordinary time-limit of sanatorium residence, and (*b*) that work of a definite character, far from impeding cure, assisted it. The farm colony then, as it was originally called, was a natural evolution of the sanatorium. Its purpose was to serve those tuberculous persons whose disease had been almost completely arrested, but who were found to remain liable to relapse when they returned to their ordinary avocations.

The original conception, therefore, was that with the patient still under medical supervision, his daily life should gradually approximate to the conditions of the ordinary working man's daily existence. The number of hours and the kind of work upon which each patient was engaged were regulated from day to day by the medical superintendent. In addition, some of the colonists, for whom return to their former occupation would mean certain recurrence of their disease, were trained in new pursuits and for them a *definite and suitable post was found before discharge from the colony.* Finally, the continued treatment and training, provided by the original farm colony, was carried out at remarkably low cost. The results were most encouraging and quite a large percentage of the colonists returned to their old occupations and remained well.

Such considerations led to the inclusion of the farm colony in the model tuberculosis scheme adopted by the Departmental Committee on Tuberculosis (1912–13). The problem of the tuberculous ex-Service man and his re-introduction into employment has played the principal part in the development of the colony idea.

We have also to thank the Inter-Departmental Committee (1919), presided over by Sir Montague Barlow, and the work of Dr. P. C. Varrier-Jones, for more recent developments. The report of that Committee stated as to training colonies (*a*) that they were only intended to provide a limited period of training, usually 6 to 12 months; (*b*) that the colonists were to be subjected to medical control and supervision; and (*c*) that they were only intended to form a stage in the treatment of the patient on the way to ordinary conditions of life or to more permanent settlements. The report quite reasonably attached immense importance to the *provision of permanent employment and settlement* under healthy conditions, and, therefore, the Committee made the permanent village settlement their chief recommendation. Shortly afterwards the Ministries of Health and Pensions issued various circulars and memoranda on the subject of vocational training colonies.

Vocational Training Colonies.

Their basic principle is to provide 12 months' training in a suitable occupation so that, at the end of that period, the trainee can leave the colony and support himself by his own exertions. The occupations selected were: pig and poultry farming; market gardening; rural carpentry; clock and watch repairing, &c. There are always a certain number of persons who can and will succeed in making a livelihood of some kind in a new occupation, when a change has to be made in middle life. Even in an ordinary healthy life, however, this is a difficult transition; how much more difficult is it for the tuberculous patient with is impaired life?

To have had any chance of real success the following conditions were essential: (*a*) a more prolonged period of treatment and training; (*b*) a first-rate organisation for securing to the trainees a suitable occupation before leaving; (*c*) an equally first-rate business organisation for marketing their products. Had those essential conditions of success been provided, the outlook to-day might have been very different.

Village Settlements.

The call for the provision of permanent employment and settlement under healthy conditions led the Inter-Departmental Committee to the conclusion that something of the

* Abridged from the opening address at the Tenth Annual Conference of the National Association for the Prevention of Tuberculosis, on July 4th, 1924, in London.

nature of a village settlement on the lines of the Papworth scheme was the most satisfactory solution of the problem of the tuberculous ex-Service men. The arguments in favour were that: (*a*) An ex-Service man is assured of good housing and of industrial occupation while he remains in the settlement; (*b*) he has the advantage and comfort of family life; (*c*) there is general medical supervision in the village settlement; (*d*) there are no advanced cases in this section of the scheme and therefore it would not be regarded as a "Leper Colony." For all practical purposes Papworth Hall and Preston Hall may be taken as best fulfilling the recommendations of the Inter-Departmental Committee, in so far as they are permanent village settlements. In these institutions quite a variety of instruction and occupation is provided in various trades—e.g., carpentry and joinery, cabinet making, portmanteau making, boot making and repairing, horticulture, pig and poultry farming, printing, bee keeping, gamekeeping, hand-made jewellery, &c. These institutions provide beds in their main buildings and in open-air shelters for the treatment of tuberculosis at various stages. There are hostels for single men and cottages for married men and their families. Other features are the payment of reasonable wages to colonists who are employed in the various workshops, and, in addition, the receipt of any disability pension to which they are entitled. Lastly, there is regular medical supervision of the colonists and their families.

I am not in a position to supply any accurate figures with regard to these two settlements, but it is probably fair to say that the capital expenditure involved in each case is not less than £250,000. Apart, therefore, from the heavy annual cost of maintenance, it is difficult to see how the erection of a number of such settlements by local authorities could be justified as a practical proposition. It must be borne in mind, too, that a large proportion of tuberculous patients are temperamentally unsuitable for colony or settlement life and that a good deal of the success of tuberculosis institutions depends on the personality, inspiration, and power of organisation of those in charge. Permanent village settlements can at the best provide *for a very limited number of T.B. patients.* On these grounds, therefore, the permanent village settlement cannot, for financial and other reasons, be regarded as having proved worthy of inclusion in the national scheme for the treatment of the tuberculous civilian.

Vocational Training Colonies.

Vocational training colonies are, however, in a different category, although in some instances conceived on too ambitious and perhaps somewhat unpractical lines. Again, the mistake has been often made of sending to them men who, by reason of the stage of disease or by temperament and physical condition, could not be regarded as suitable for colony life.

Apart from these fundamental errors, the criticism may be justly made that training rather than treatment appears to be made the paramount consideration, and to make matters worse, the complete absence of any organisation for the provision of a suitable post for every colonist before leaving has been a disastrous oversight.

I plead, therefore, for an immediate realisation and frank recognition of these facts and a return to the sound conceptions upon which the original idea of the colony was based—namely, that the colony is an expansion of the sanatorium for patients for whom extended treatment is necessary. Broadly speaking, the colony at Burrow Hill has realised in considerable degree the aims and objects to which I have referred. Its success, however, would have been enhanced had it been possible to limit admission more rigidly to patients at stages in the disease likely to benefit from the opportunities afforded and it has also suffered from lack of an efficient system of care organisation.

Summary of Fundamental Principles.

In relation to tuberculosis schemes as a whole, we should keep in view certain fundamental principles which may be summarised as follows: (1) Tuberculous infection is almost universal; (2) its obvious manifestations are numerous and vary much in character and degree; (3) attention has hitherto been directed mostly to grosser and later manifestations, notably pulmonary tuberculosis and various forms of crippling; (4) during more recent years it has been demonstrated that tuberculosis infection is, in most instances, contracted in childhood, and that later manifestations are, as a rule, resultants of an earlier infection; (5) although infection is thus widespread and generally contracted in childhood, only a small fraction suffer seriously therefrom; (6) the varying character of clinical manifestations is conditioned largely by varying resistance on the part of the infected individual; (7) in approaching the problem of treatment, attention must be directed to (*a*) the infection proper and (*b*) the degree of resistance which may be offered to its spread; (8) the aim of treatment should be to reduce, as far as possible, occasions of exposure to contagion, and to minimise the results of infection; (9) the treatment of an individual patient is successful in proportion as treatment is commenced early. Early treatment may succeed in *de*tuberculising the infected persons *before* the grosser manifestations of the disease have occurred; (10) in proportion as treatment is made effective throughout a community by the applications of physiological—i.e., sanatorium—methods to cases at the *curable* stage, the need for measures, institutional or other, for the grosser manifestations will lessen and in large part disappear. This should be the ultimate aim of tuberculosis schemes. (11) The keynote of the tuberculosis dispensary, tuberculosis school, sanatorium, and training colony is *de*tuberculisation and recovery. (12) The modern conception of the ætiology of tuberculosis emphasises strongly the possibility, and the significance, of early recognition of the infection and deliberate treatment with a view to *de*tuberculisation at the earliest possible moment. (13) That is the outlook and aim of preventive medicine, and must become more and more the outlook and aim of the general practitioner as well as the tuberculosis officer.

CARE OF THE FEEBLE-MINDED.

THE annual meeting of the Incorporated Lancashire and Cheshire Society for the Permanent Care of the Feeble-Minded was held in the Manchester Town Hall on June 26th. Miss Dendy, its foundress and President, late Commissioner of the Board of Control, occupied the chair in the absence of the Lady Mayoress. The annual report submitted for adoption showed that the 296 places in the Sandlebridge Colony, conducted by the Society, are fully occupied. A new house is in process of building and has been approved by the Board of Control for 25 more patients. The applications for places by public authorities have always been very largely in excess of the number which can be received, thus showing, as has been frequently shown in previous reports, the great lack of residential school provision throughout the country for feeble-minded children. It is the great feature of Sandlebridge that life provision is made for all children received. The report stated that the occupations followed by the women and older girls—housework, laundry work, sewing, and knitting—showed satisfactory progress, and everyone had the pleasure of knowing that her share in the work, if it was only turning the mangle, or picking bits off the mats, or setting the table, had been of use in the daily life of the institution. The girls took great interest in the folk-dancing. In the workshops for the men and older boys boot-making, tailoring, mat-making, brush-making, and weaving was carried on. In submitting the report for adoption, Miss Dendy said that it had become more and more evident that segregation was the only method of dealing with the feeble-minded which was effective as well as proper to be used; there was a growing tendency brought about by the vastness of the problem to think that docile and harmless youths and girls might be dealt with by supervision in their own homes. Docile such patients might be, but nothing could prevent their being potentially dangerous. They were almost sure to become parents either with or without marriage. The speaker continued: "We have under our care two generations of one family, and we have over 200 adults who have been with us since childhood. Had they not been with us how many more to care for would there have been? Eight hundred is a low estimate. Having these children young, they become accustomed to their life and segregation is not the burden to them that it undoubtedly is to many who are cared for only when they have become, at large, an intolerable nuisance. And all of these adults would have been unemployed." The governing body of the Society were re-elected for the coming year and the meeting closed with a vote of thanks to Miss Dendy for her address.

At the annual meeting of the Agatha Stacey Homes, Birmingham, on June 25th, Mrs. Herbert L. Wade, the President, in the chair, the importance of the segregation of the mentally deficient was also emphasised. The report stated that the committee had been compelled during the past year to return some of the older inmates to the care of the Poor-law guardians in order to make room for the younger cases who were in grave moral danger. In seconding the report, Miss Walford, secretary of the Warwickshire Voluntary Association for Mental Welfare, pointed out that the homes were doing invaluable work in protecting the nation from high-grade defectives. These persons, she said, if left at large, cost the taxpayer four times as much as if they were placed in a home. Dr. Marion Burt, school medical officer of Birmingham, said that they hoped greatly to benefit succeeding generations if they could put a satisfactory check on the worst types by means of segregation.

A little over a year ago a small training home for feeble-minded girls at Fairwarp, near Uckfield, was established by the aid of the East Grinstead Case Committee of the East Sussex Voluntary Association for Mental Welfare. The

first annual report of the home has just been issued and shows that the 15 beds with which it was provided are now full. The cost of the home for the year has been £750, which has been met by the payment of £1 per week for each inmate. Only three of the girls admitted have so far proved unsuitable for residence, and the progress made by all the girls in the year seems to the committee to be most satisfactory. An effort has been made to train the girls among pleasant surroundings, to render themselves at least partially self-supporting. The committee hopes to be in a position shortly to increase the scope of the work, and by raising a case fund to provide a free, or nearly free, bed for a local case.

PORTABLE RADIOGRAPHS.

THE lack of efficient radiographic facilities is often a severe handicap to the practitioner whose work lies at some distance from the nearest hospital or private installation. To these practitioners the services of a firm possessing complete portable equipment for all kinds of radiographic work should be of great value. A firm known as "Portable Radiographs," of 1, Woodstock-road, Bedford Park, London, W. 4, now undertakes work of this description. The apparatus employed has been specially designed, and is transported in a plain, closed motor, the engine of which supplies the necessary electric current. From the special alternator mounted on the bonnet of the car two wires are led through a convenient window in the sick-room, and are connected at the bedside to the portable X ray apparatus, which is not bulky. At a recent demonstration the complete apparatus was installed and connected in the space of half an hour, three radiograms were taken and developed in the motor-car, and were ready in the course of a few minutes. The whole procedure was efficiently carried out and the definition of the radiograms was excellent. Screen-work can also be undertaken and a screening couch is carried. The firm informs us that it undertakes work for the medical and dental professions only, and that further the staff works under the instruction of the medical man in charge of the case. The various applications of such service are sufficiently obvious. We understand that the apparatus was employed in connexion with the recent Rodeo exhibition at Wembley.

CURATIVE RHYTHM AND THE PRACTITIONER.

To the Editor of THE LANCET.

SIR,—Will you permit me to draw the attention of medical men to the treatment known as "curative rhythm" instituted by Miss Anne Walton? Some years ago I wrote a pamphlet entitled "Created Rhythm," in which I pointed out that this treatment is based on the same rhythmic power that seeks expression through nature, music, our varied sciences, arts, literature, &c. I then pleaded that this new treatment should be tested by the medical profession to prove its justification in the same way that massage and suggestion therapy have been tested. I am glad to say that it is becoming more recognised by large numbers of the medical profession that rhythm acts not only as a powerful eliminator of mental and physical disabilities, but also as a powerful mental and physical recuperative. The treatment has been developed quietly in coöperation with medical men, but there are still large numbers who have never heard of it. The method includes relaxation, rhythmic manipulation, suggestion therapy, rhythmic movements combined with breathing. Some of the disorders which have been successfully treated by this method are insomnia, neurasthenia, neuritis, habit spasms, writers' cramp, lack of concentration, faulty posture, and dyspepsia.

Further information can be obtained from the secretary, 24, Welbeck-street, Cavendish-square, W. 1, where this treatment is being carried on. It is also available at Brighton and Harrogate.

I am, Sir, yours faithfully,

THEO. B. HYSLOP, M.D., F.R.S.E.

Portland-place, W., June 26th, 1924.

PUBLIC HEALTH IN BIHAR AND ORISSA.

WITH an abundant rainfall, generally favourable in its distribution, the year 1922 was the most prosperous and healthy which this province had known for a considerable period, and was specially characterised by the absence of any important epidemic disease. The death-rate was 24·1 per 1000, as compared with 32·8 in 1921, 39·6 for the preceding five years, and 35·3 for the decennium. The population (census of 1921) was 34,002,189 (not including the tributary States of Orissa, the vital occurrences in which are not included in this report). The birth-rate was 35·0 per 1000, compared with 34·6 in 1921, and 38·4 in the preceding decennium. In Purnea district it was only 26·3; in Angul it was 42·9. The ratio for rural areas was 35·2; for towns 30·0 per 1000. Among the former it varied from 28·5 in Purnea to 42·9 in Angul; for the latter, from 11·1 at Dhanbad and 12·7 at Giridih, to 48·9 at Lalganj and 49·2 at Hajipur. "The low birth-rate recorded in Dhanbad and Giridih is probably due to the large floating population connected with the coal-mines, and to the excess of males in the population of such towns. Defective reporting is also probable, owing to the population of these towns being migratory." Lieut.-Colonel W. C. Ross, Director of Public Health for the province, who presents this report,[1] considers with regard to the death-rate, "that it is unlikely that this high standard will be maintained in future years, but the low rate now reported shows clearly what is possible when conditions are favourable, and what may again be achieved if steady progress is made in the improvement of sanitary conditions." It may be hoped (and indeed expected) that this high standard *will* be maintained. The results of progress are evident, and themselves constitute an encouragement for continuance in the right direction. In regard to infantile mortality the ratio per 1000 births was 139·9, as compared with 159·0 in 1921; in the towns it was 165·9, and in the rural areas 139·1. As to class, or religious persuasion, amongst Hindus, who form the bulk of the population, the death-rate was 24·7; for Mohammedans 20·7; for Christians 14·4; and for "other classes" 22·8 per 1000. In regard to vital statistics Colonel Ross emphasises their importance and utility, regarding them as "the barometer of public health. . . . Let us accept the proposition that public health is an economic question and must be dealt with accordingly."

The general death-rate of the province, as already mentioned, was only 24·1 per 1000; of this total, 17·0 per 1000 is ascribed to "fevers," as compared with 22·6 in 1921, and 27·4, the quinquennial average. This improvement (as regards the average) was manifest in every district of every division. The highest fever mortality ratios were returned from the districts of Palamau (22·1), Muzaffarpur (20·6), and Shahabad (20·3), where the quinquennial averages had been 33·6, 29·1, and 36·2 per 1000 respectively. In Angul district, where the quinquennial fever mortality had been higher than in any other (37·6), the ratio fell to 19·6. Cholera caused 26,805 deaths (0·7 per 1000), all of which, except 852, occurred in the rural areas; and the same ratio per 1000 (0·7) applies equally to these areas and to the towns. The improvement was very great as compared with 2·6 in the previous year, and 3·1 in the quinquennium. In the various districts the mortality ranged from 0·005 in Angul and Singhbhum, and 0·006 in Ranchi, to 2·3 in Muzaffarpur and 1·7 in Balasore. It is satisfactory to learn that "the use of permanganate of potash and chlorinated lime for disinfecting wells has now been generally adopted by local bodies, and the procedure is now generally known and appreciated."

ARTIFICIAL LIMBS.

WE have received from Messrs. W. R. Grossmith, Ltd., a small pamphlet entitled "Nature Reproduced," in which are recorded some of the achievements of amputees who use the artificial limbs of this well-known firm. The merits of the "Anglesey" pattern artificial leg, which has been in use in this country since the middle of the last century, have long been known, but have been perhaps unduly overshadowed by the successes achieved by American types, especially those modified and improved by British makers during the war. Nevertheless, the fact remains that Anglesey legs, when properly made and fitted, can be as light as, or even lighter than, any other limbs upon the market, whether made of metal, leather, wood, or composition; their wearers have achieved notable successes in walking competitions and have taken part in all manner of sports and occupations. Their durability when fairly used is shown by the testimony of amputees who have worn the same limb for 20 or 30 years. Recognition of the merits of one type of limb by no means implies condemnation of other types, for in prosthetics the proverb "One man's meat is another man's poison" is most emphatically true. The personal equation is one of the most important factors in the solution of the problems of prosthetics, and here, again, the man is more than the machine.

[1] Public Health Report, 1922. Patna: Superintendent, Government Printing. 1923.

THE LANCET: SUBSCRIPTION RATES.

INLAND	One Year	£2	2	0
	Six Months	1	1	0
	Three Months	0	10	6
ABROAD	One Year	2	10	0
	Six Months	1	5	0
	Three Months	0	12	6